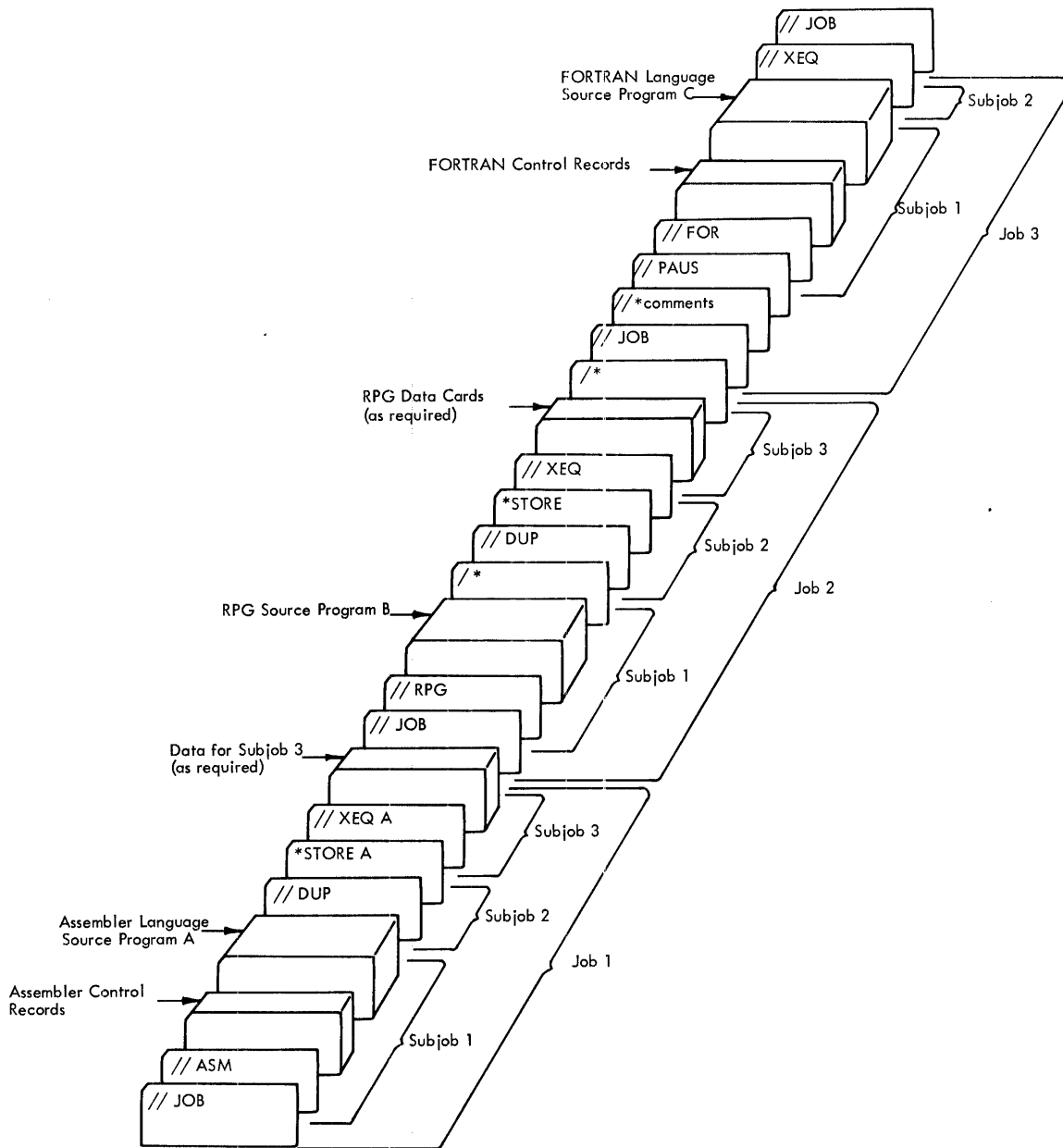


## Systems Reference Library

### **IBM 1130 Disk Monitor System, Version 2 System Introduction**

This publication describes the 1130 Disk Monitor System, Version 2.

The 1130 Disk Monitor System, Version 2, is a combined programming and operating system that provides for continuous operation of the 1130 in a stacked job environment. This monitor system supports the expanded hardware features and the high-speed input/output devices available on the 1130.



●Figure 1. Stacked Job Input

Fifth Edition

This edition is a revision of, and obsoletes, the previous edition (C26-3709-3). The manual has been revised to show the addition of 1130 RPG to the Monitor system.

Specifications contained herein are subject to change from time to time. Any such change will be reported in subsequent revisions or Technical Newsletters.

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The 1130 Disk Monitor System, Version 2, is a disk-resident system capable of assembling, compiling, and executing programs on a continuous basis from stacked job input.

- The complete Monitor system resides on disk.
- Only a minimal amount of core storage is reserved for use by the Monitor system (Resident Monitor).
- Only the programs required to perform the current job are fetched into core for execution.

The Monitor system is loaded to an initialized disk cartridge using the System Loader provided by IBM. This cartridge is then called the system cartridge. Placement of a system cartridge on any physical drive readies the Monitor system for a user-initiated cold start procedure. The cold start establishes the physical drive on which the system cartridge has been placed as logical drive zero, which is, by definition, the system drive. In addition, the system cartridge on logical drive zero becomes the master cartridge. All other initialized cartridges on the system are called satellites. (The cartridge initialization procedures--writing disk addresses and establishing system parameters in the first sector of the cartridge--are performed using a stand-alone utility for the master cartridge and an executable program within the Monitor system for the satellites.)

After initialization and system loading procedures are completed and the cold start procedure is performed, the Monitor system is on-line and ready to accept user programs from the system input device.

The 1130 Disk Monitor System, Version 2, is now capable of assembling, compiling, and executing programs on a continuous basis from stacked job input:

- Programs are loaded and executed under control of user-punched control records
- The Monitor system performs the requested operations as each job (and subjob) is read from the system input device
- The system operates with a minimum of operator intervention

Figure 1 illustrates the input stream, that is, the stacked job input to the Monitor system. The input stream comprises control records, source programs, object programs, and data. This stream of input to the Monitor system is also illustrated as job and subjob components.

In the input stream to the Monitor system, a job is defined as

- The processing that takes place from the detection of a JOB Monitor control record until the detection of another JOB Monitor control record.
- A JOB Monitor control record and all the following control records, source programs, object programs, and data, up to, but not including, the next JOB Monitor control record.

A subjob is defined as

- The processing that takes place from the detection of a Monitor control record until the detection of another Monitor control record.
- A Monitor control record and all the following control records, source programs, object programs, and data, up to, but not including, the next Monitor control record.

A job is an independent unit of processing; a subjob is a unit of processing that is dependent on the subjobs preceding it and upon which the following subjobs are dependent. The successful completion of the job depends on the successful completion of each subjob within it. In some cases, a subjob is not attempted if the preceding subjobs have not been successfully completed.

#### SYSTEM COMPONENTS

The Monitor system consists of eight distinct but interdependent programs: Supervisor, Disk Utility (DUP), FORTRAN Compiler, RPG Compiler, Assembler, System Library, Core Load Builder, and Core Image Loader.

Supervisor. The Supervisor program provides the linkage between user programs and Monitor programs.

The Supervisor is directed by Monitor control records read from the input stream. The part of the Supervisor that always resides in core and provides the basic linkage is called the Skeleton Supervisor.

DUP. The Disk Utility Program (DUP) is actually a group of programs provided by IBM to perform certain frequently-required operations involving the disk, such as storing, moving, deleting, and dumping data and/or programs. These operations are called, for the most part, by user-supplied DUP control records.

FORTRAN Compiler. The FORTRAN Compiler translates source programs written in 1130 Basic FORTRAN IV language into machine language object programs. The compiler also provides for the calling of the necessary arithmetic, function, conversion, and input/output subprograms at execution time.

At the user's option, the compiler may be deleted during system load or at any time after system load.

RPG Compiler. The RPG Compiler reads program specifications written in RPG language and produces an object program in machine language that can be used to perform particular applications.

At the user's option, the RPG Compiler may be deleted during system load or at any time after system load.

Assembler. The Assembler converts source programs written in Assembler language into machine language object programs.

At the user's option, the Assembler may be deleted during system load or at any time after system load.

System Library. The System Library consists of (1) a complete library of input/output (except disk I/O) subroutines, data conversion subroutines, and arithmetic and function subprograms, (2) selective dump subroutines, and (3) special mainline programs and subroutines used for disk maintenance and (4) subroutines for performing synchronous communications via the Synchronous Communications Adapter.

The System Library is initially loaded into the User Area on a system cartridge. However, the user may, at his option, move the System Library from a system cartridge to the User Area on a non-system cartridge (a satellite cartridge).

Certain programs in the System Library, namely, the disk maintenance programs, are required for the operation of the system; these programs may not be

deleted from the System Library. Other portions of the System Library may be deleted at the user's option.

Core Image Loader. The Core Image Loader is the program that is called to process the three entries to the Skeleton Supervisor — LINK, DUMP, and EXIT (the Skeleton Supervisor is a part of the Resident Monitor and is thus core-resident). The Core Image Loader is assigned this task in order to achieve the fastest possible link-to-link transfer of control via CALL LINK.

On a LINK entry to the Skeleton Supervisor, the Core Image Loader handles the locating and fetching of the core load and the calling of the Core Load Builder, if necessary. On an EXIT or DUMP entry, the Core Image Loader calls the appropriate Supervisor program into operation and the system continues to the next job or dumps requested data on the principal print device.

Core Load Builder. The Core Load Builder builds a specified mainline program into a core image program. The mainline program, with its required programs (LOCALs and SOCALs included), is converted from Disk System format to Disk Core Image format. During the conversion, the Core Load Builder also builds the Core Image Header Record and Transfer Vector. The resultant core image program is suitable for immediate execution or for storing on the disk in Disk Core Image format for future execution.

## System Loading and Initialization Programs

System Loader. The Monitor system is loaded on disk using a System Loader provided by IBM. The configuration of the features and I/O devices is defined to the Monitor system through user-punched System Loader Control cards.

Cold Start Program. The Cold Start Program (loaded as part of the IBM system) initializes the 1130 Disk Monitor System, Version 2. It is read into core as a result of the user-initiated Cold Start procedure.

## Stand Alone Utilities

Provided with the Monitor system are a group of self-loading utility programs that enable the user to

perform operations external to the Monitor system. These programs are:

- Console Printer Core Dump. This program aids the user in debugging programs by dumping selected portions of core on the Console Printer.
- Printer Core Dump. This program dumps core in hexadecimal format on either the 1403 Printer or the 1132 Printer.
- Disk Cartridge Initialization Program (DCIP). This program is used to initialize a disk cartridge preparatory to Monitor system load. This program also contains disk copy and disk dump features.
- Paper Tape Reproducing (paper tape system only). This program gives the user the capability of reproducing paper tapes with no intermediate conversion.
- Paper Tape Utility (PTUTL). This program, available also as an executable program within the Monitor system, allows the paper tape user to modify existing tapes and create new tapes through the use of Keyboard input. Input is from the 1134 Paper Tape Reader and/or the Keyboard. Output is on the 1055 Paper Tape Punch. The output may also be listed on the Console Printer if desired.

#### Additional Support

Programming support is available that enables FORTRAN IV or Assembler language users of the Disk Monitor System to display images on an IBM 2250 Model 4 Display Unit and to communicate with a remote System/360. This support is optional; it is not provided with the Disk Monitor System.

The optional programs are:

- Graphic Subroutine Package, which enables the FORTRAN IV or Assembler language programmer to display images in the form of lines, points, and characters on the screen of a 2250 Model 4 Display Unit attached to the 1130 system. The program also provides for communication between the 2250 operator and the user's program.
- Data Transmission Subroutines, which enable the FORTRAN IV or Assembler language programmer to transmit data between a program being processed by the Disk Monitor System and a program being processed by a remote System/360 Operating System. These subroutines permit an 1130 program to use the high-speed computational capability and large storage capacity of the System/360. Communication between the two systems is accomplished in

binary synchronous mode via telecommunication lines.

- Satellite Graphic Job Processor, which enables the user at a 2250 Model 4 Display Unit attached to the 1130 to easily start the processing of programs in a remote System/360 Operating System. This allows the 2250 user to access the high-speed computational capability and large storage capacity of the System/360. Communication between the two systems is accomplished in binary synchronous mode via telecommunication lines. Use of the Satellite Graphic Job Processor requires the data transmission subroutines discussed in the preceding paragraph.

#### SYSTEM OPERATION

The Supervisor is initially brought into control by means of the Cold Start procedure. The Supervisor then begins analyzing Monitor control records from the input stream. If a Monitor control record indicates a Supervisor operation only (JOB, PAUS, TYP, TEND, or Comments), the appropriate operation is performed and the Supervisor reads and processes the next Monitor control record from the input stream.

When a Monitor program is requested on a Monitor control record (DUP, FOR, RPG or ASM), the appropriate program is fetched by the Supervisor and control is transferred to it. Control is returned to the Supervisor by the Monitor program at the normal completion of its operation(s) or when it detects a Monitor control record in the input stream.

If a core load execution is requested by a Monitor control record (XEQ), the Supervisor fetches the Core Image Loader and transfers control to it. If the program to be executed is in Disk Core Image format (that is, it is a core image program), it is fetched and control is passed to it. If the program is in Disk System format, (that is, it is a DSF program), the Core Image Loader calls the Core Load Builder to construct a core image program. When the building of the core image program is complete, it is loaded into core by the Core Image Loader and control is passed to it.

If a core load terminates with a CALL LINK, the Skeleton Supervisor is entered at the LINK entry point. The Skeleton Supervisor calls the Core Image Loader to (1) save any COMMON defined below location 4096 by the previous core load, (2) look up the next link (the DSF program or core image program specified in the CALL LINK as the next program to be executed) in LET/FLET, the directory to the disk,

(3) build a core image program, if necessary, via the Core Load Builder, and (4) fetch the core load and pass control to it.

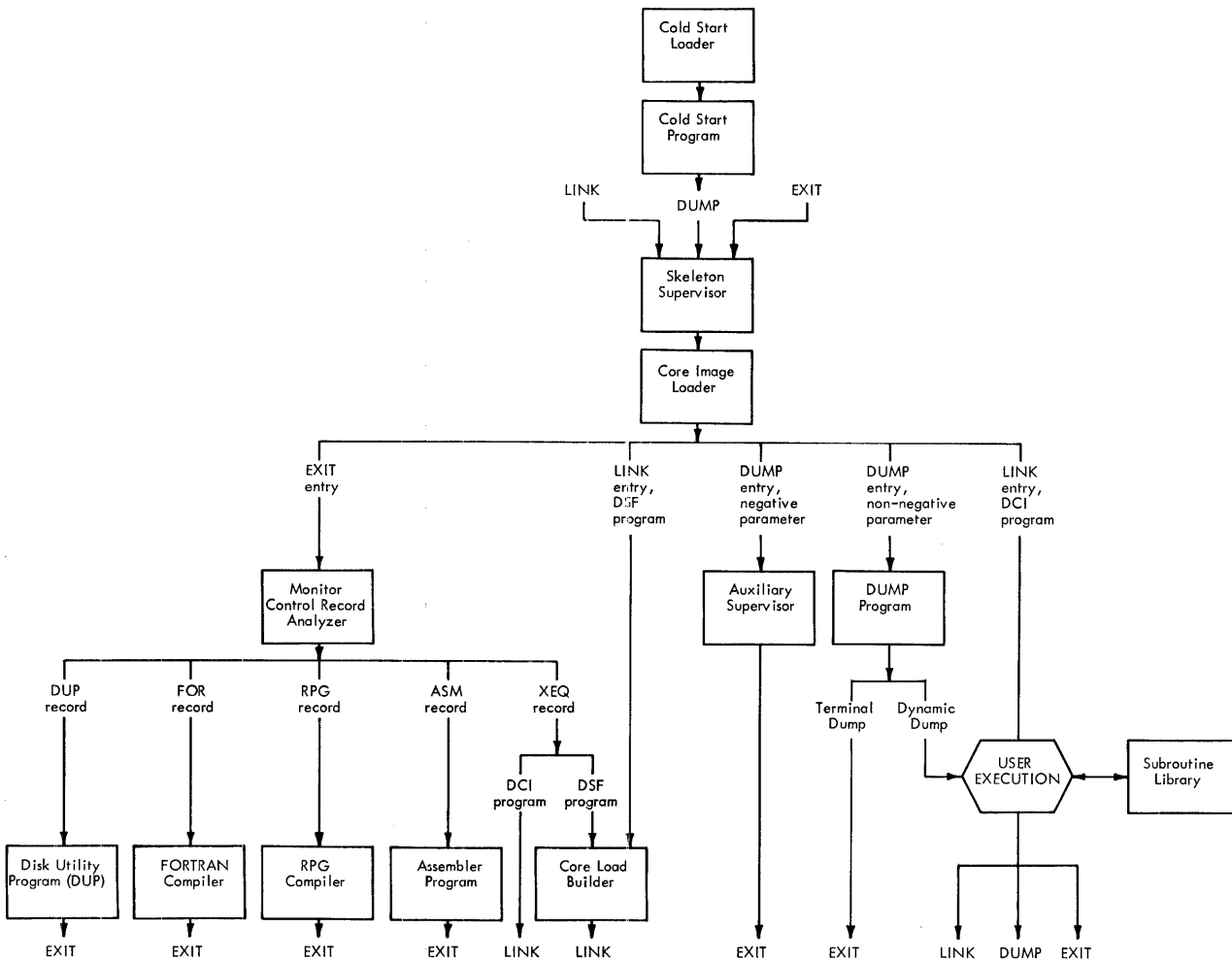
If a core load terminates with a CALL EXIT, the Skeleton Supervisor is entered at the EXIT entry point. The Skeleton Supervisor calls the Core Image Loader, which, in turn, calls the Supervisor into core to read and process the next Monitor control record from the input stream.

If a dynamic dump of the contents of core is desired during the execution of a user program, the Skeleton Supervisor is entered at the DUMP entry point. The Skeleton Supervisor saves core (below location 4096) in the Core Image Buffer (CIB) and

calls the Core Image Loader, which in turn, calls the Supervisor DUMP program. The contents of core are printed, core below location 4096 is re-stored from the CIB, and the DUMP program returns control to the user program at the core location following the call to the DUMP program.

If a terminal dump of the contents of core is desired following the execution of a user program, the Supervisor is entered at the DUMP entry point plus 1. The contents of core are dumped as described above and the DUMP program terminates with a CALL EXIT.

Figure 2 shows the overall logic of the 1130 Disk Monitor System, Version 2.



●Figure 2. Logic Flow of the Monitor System

## SYSTEM CONFIGURATION

The minimum system configuration required by the 1130 Disk Monitor System, Version 2, is as follows.

- IBM 1131 Central Processing Unit, Model 2, with 4096 words of core storage. (Note: The 1130 RPG Compiler requires 8192 words of core storage.)

And one of the following I/O devices:

- IBM 1442 Card Read Punch, Model 6 or,
- IBM 2501 Card Reader in combination with the IBM 1442 Card Punch, Model 5 or,
- IBM 1134 Paper Tape Reader in combination with the IBM 1055 Paper Tape Punch.

The IBM 1130 Disk Monitor System, Version 2, will support the following features and I/O devices.

IBM 1131 Central Processing Unit, Model 2, with 4096, 8192, 16384, or 32768 words of core storage

IBM 1131 Central Processing Unit, Model 3, with 8192, 16384, or 32768 words of core storage

IBM 2310 Disk Storage, Model B1 and B2

IBM 1442 Card Punch, Model 5 - may not be used with 1442-6 or 1442-7

IBM 1442 Card Read Punch, Model 6 or 7 - may not be used with 1442-5

IBM 2501 Card Reader, Models A1 and A2 - may not be used with 1231

IBM 1231 Optical Mark Page Reader - may not be used with 2501

IBM 1134 Paper Tape Reader and IBM 1055 Paper Tape Punch

IBM 1132 Printer

IBM 1403 Printer, Model 6 or 7

IBM 1627 Plotter

Synchronous Communications Adapter

IBM 2250 Display Unit Model 4

## SYSTEM PUBLICATIONS

The publications listed below will assist the user in utilizing the 1130 Disk Monitor System, Version 2.

IBM 1130 Functional Characteristics (Form A26-5881)

IBM 1130 Computing System Input/Output Units  
Form A26-5890)

IBM 1130 Disk Monitor System, Version 2, Programming and Operator's Guide (Form C26-3717)

IBM 1130 Assembler Language (Form C26-5927)

IBM 1130/1800 Basic FORTRAN IV Language  
(Form C26-3715)

IBM 1130 Subroutine Library (Form C26-5929)

IBM 1130 RPG Specifications  
(Form C21-5002)

IBM 1130/2250 Graphic Subroutine Package for Basic FORTRAN IV (Form C27-6934)

IBM System/360 Operating System and 1130 Disk Monitor System: System/360-1130 Data Transmission for FORTRAN  
(Form C27-6937)

IBM System/360 Operating System and 1130 Disk Monitor System: User's Guide for Job Control From an IBM 2250 Display Unit Attached to an IBM 1130 System  
(Form C27-6938)

## IBM 1130 REMOTE JOB ENTRY

The 1130 Remote Job Entry Work Station Program provides the ability to use the IBM 1130 Computing System as a remote work station to enter OS/360 jobs to be executed at a central computing facility and to receive the job output.

The 1130 RJE program provides three basic functions:

1. Input of OS/360 jobs and RJE commands through an attached input device.
2. Data transmission to and from the central processor.
3. Data output to an attached printer, punch or disk.

OS/360 jobs are entered through the card reader or from disk storage. Work station commands are entered from the card reader, disk storage, or the console-keyboard.

Job output is directed to the printer, punch or disk storage. If desired, disk output may be replaced by a user-written output routine. Messages are sent to the console-printer or the line printer.

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IBM 2310 Disk Storage, Model B1 and B2

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IBM 1130 Subroutine Library (Form C26-5929)

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Job output is directed to the printer, punch or disk storage. If desired, disk output may be replaced by a user-written output routine. Messages are sent to the console-printer or the line printer.



The work station program operates under the 1130 Disk Monitor System, Version 2.

For general RJE information see IBM System/360 System, Remote Job Entry (Form C30-2006), and

for information concerning the 1130 Computing System as a work station see IBM 1130 Disk Monitor System, Version 2, Programming and Operator's Guide (Form C26-3717).



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