

OS/3**PROGRAM
PRODUCT
SPECIFICATION****System Control Software
Type Number: 6210-XX****SECTION I**

The System Control Software (SCS) consists of system and utility programs that are the basis of the SPERRY UNIVAC Operating System/3 (OS/3). SCS routines perform the important functions needed to use OS/3, such as scheduling and running jobs, managing files, maintaining program libraries, and preparing disks, diskettes, and tapes for use. SCS also aids in software maintenance and in tailoring OS/3 to fit the particular needs of your site. In addition, SCS provides a variety of interactive processing services and programs. Since SCS is the basis of OS/3, it is always provided in an OS/3 release.

PRODUCT FEATURES

SCS components include facilities for:

- Interactive Services
- Job Control
- Data Management
- System Installation and Verification
- Supervisor
- Software Maintenance

These components are explained in detail in the following paragraphs.

INTERACTIVE SERVICES

The ease-of-use characteristics provided in OS/3 are derived in large measure from its interactive capabilities. OS/3 users that communicate with the Operating System through CRT devices (e.g., workstations, terminals) can accomplish more, in a timely fashion, than is possible with batch processing. Interactivity under OS/3 means two-way communication between the user and the Operating System. It enables the user to receive results more quickly and to work with the Operating System to correct errors and solve problems that may arise during job processing.

The SCS package supplies the user with four means of using OS/3 interactively:

- The Interactive Command Language
- The Workstation Access Method
- The Dialog Processor
- The Screen Format Coordinator

Interactive Command Language

The Interactive Command Language is a set of commands that allow users to perform many functions previously available only to the system operator. A user can run jobs, monitor them as they run, and terminate them. The Interactive Command Language also permits the user to perform utility functions, such as making copies of files, recovering deleted library file elements, sending messages to other interactive users and the system operator, and obtaining information about the files on a given disk volume.

Workstation Access Method

The Workstation Access Method (WSAM) is a package of routines that enable system programs and user programs to use the workstation for data input and output. Through WSAM, the user can control the management of the workstation's display screen, as well as the movement of data between a program and the workstation.

Dialog Processor

The Dialog Processor improves the efficiency of workstation input by managing interactive dialogs between the user and the Operating System. It displays dialog text on a workstation screen, and the user responds to the dialog through the workstation keyboard. The Dialog Processor works on behalf of an application or system program, to which it routes the user's responses. Dialog processing offers several advantages over simple WSAM workstation use. A dialog can display different questions depending on the responses to previous questions so that the user need not respond to irrelevant questions and messages. It can validate responses to prevent inaccurate data from reaching the application program, and it keeps a complete record of a dialog session for later use or for audit purposes. Finally, HELP screens can be written to explain dialog choices or concepts during the dialog session. Sperry Univac supplies certain dialogs for interactive system functions. Users who wish to use dialogs with application programs must write their own dialog, using the Dialog Specification Language (DSL).

Screen Format Coordinator

The Screen Format Coordinator manages pre-stored workstation displays called screen formats. Like the dialog processor, it operates on behalf of an application or system program. Each screen format may contain fixed data for display and variable data for input and output. The use of screen formats makes data entry much easier because it presents

the user with a "form" on the workstation screen, which can be "filled out" by entering data in designated spaces. Data output from a program can be made much more intelligible by the use of screen formats because the data may be displayed in a format, where fixed screen information identifies the variable output data. A single screen can be used for input, output, or both. The Screen Format Coordinator can also verify and edit variable data to ensure uniformity. Some SCS facilities and system programs use screens supplied by Sperry Univac. You can create screen formats for use in your application programs through the optional Screen Format Generator (SFG) Program Product.

Interactive services support other OS/3 products, some of which are SCS components like interactive job control preparation and the interactive preparation of system generation parameters.

JOB CONTROL

Job Control enables you to tell the system how a job is to be processed. It also allocates system resources to a job and determines how and when the job should run in a multi-jobbing, OS/3 environment. With Job Control, you only specify a general "outline" of how the job is to be run; the processing is handled by Job Control itself. Job Control facilities include the Job Control Language, interactive Job Control preparation, the run processor, the OCL (IBM System/3 Operation Control Language) processor, the job scheduler, and the job step processor.

Job Control Language

The Job Control Language (JCL) is the part of Job Control most visible to OS/3 users. It consists of individual Job Control statements that instruct the Operating System on how to process a job. A set of these statements performing a specific function can be made into a job control procedure (jproc), which may then be called with a single statement. The statements and jprocs prepared for a job constitute its Job Control stream.

Interactive Job Control Preparation

Users can code a Job Control stream independently or with the assistance of the system. The assistance is provided by a system program called Interactive Job Control Preparation. It engages the user in a dialog to build Job Control streams or jprocs and store them, ready to run, in a system library file. Interactive Job Control Preparation prompts the user for parameters that describe the job, checks the responses for syntactical correctness, and then uses the valid responses to tailor the Job Control stream.

Run Processor

The Run Processor translates Job Control statements, expands jprocs (by replacing a jproc call with the statements contained in the body of the jproc), checks the order and syntax of the Job Control stream, and generates structures needed to begin running the job. The Run Processor may be initiated or "called" from the system operator's console, a user's CRT device, or from another Job Control stream or program.

OCL Processor

The OCL Processor accepts control statements written in the IBM System/3 Operation Control Language (OCL) and processes them in much the same way as the Run Processor processes OS/3 Job Control statements. When an OCL job has been processed, it becomes ready for scheduling.

Job Scheduler

The Job Scheduler identifies the resources needed by a job, and, when all needed resources become available, schedules the job for execution. Input to the Job Scheduler comes from the run or OCL processors.

Job Step Processor

The Job Step Processor performs "housekeeping" duties necessary between execution of job steps. It "cleans up" after the job just finished, and prepares for the next job step to be initiated. Its housekeeping activities include scratching and allocating files needed by a job step, performing shared code analysis, and handling certain messages.

DATA MANAGEMENT

Data Management allows the user to move data between the central processor and files on several peripheral devices (disks, diskettes, paper peripherals and workstations) with a minimum of programming effort. There are two types of Data Management available with OS/3: Consolidated Data Management and Basic Data Management.

Consolidated Data Management

Consolidated Data Management (CDM) allows the user to access files without being aware of which device the file resides on. All the user needs to do is make a request within the program and CDM moves the data to or from that particular device. Thus, the input file for a program may be on punched cards for one run and on a diskette for a later run. The user doesn't need to change the program between runs; CDM resolves the differences between diskette and punched card devices and makes them appear logically identical to the user's program. Disk and diskette files may be accessed sequentially, by relative record number, or by up to five different keys in five indexes. Data records are written on disks or diskettes in data record slots, which, for either fixed or variable-length records, are of uniform size and may span physical blocks, sectors, tracks, cylinders, and even volumes.

Basic Data Management

Basic Data Management (BDM) ensures compatibility with past OS/3 releases. It is only available on Series 90 OS/3 Operating Systems. Sequential access can be used with all devices under BDM. For disk files, direct, indexed, and random access are supported.

Series 90 hardware can use either CDM or BDM, or both. CDM must be used if Interactive Services are being used. CDM is the only form of Data Management available on System 80.

SYSTEM INSTALLATION AND VERIFICATION

The System Installation programs are another part of the SCS package. These programs permit the installation or update of an Operating System to meet the requirements of an individual site. The System Installation functions are divided into many phases. Thus, a given site need only use as much of the System Installation routine as is necessary, whether the task is generating a new supervisor or updating the system resident volume to the current OS/3 release level.

Execution of System Installation routines is controlled by the entry of parameters that tailor OS/3 to the specific needs of a given site. SCS contains a routine that allows the System Installation parameters to be entered interactively. With interactive preparation, the parameters are entered by using a workstation dialog. The system asks for parameters, checks them, and builds a module containing these valid input parameters for the System Installation programs. SCS also includes a set of programs that demonstrate that the installation of a software product was performed successfully and that the product is ready for customer use. These programs are called Installation Verification Programs.

SUPERVISOR

The Supervisor interacts with system programs and user application programs to provide services and control. The Supervisor handles randomly occurring external events, such as errors, and minimizes their impact on the system.

The Supervisor routines most often used always reside in main storage. Other routines (less frequently used) are stored on the system resident volume. These routines are named transient routines because they are called into main storage, executed, and, when they are no longer needed, are replaced. This arrangement increases Supervisor efficiency in two ways. First, it minimizes the main storage needed to load transient routines. Second, it eliminates the input/output time needed to load the most frequently used routines by keeping them resident in main storage.

The Supervisor does much of its work by manipulating tasks (basic units of work that compete with each other for control of the central processor). Each task controls a system or user program. The system is capable of handling up to 256 tasks simultaneously. This capability, called multitasking, maximizes processor use.

SOFTWARE MAINTENANCE

Operating System/3 is maintained through periodic issuance by Sperry Univac of System Maintenance Packages (SMP). The SMPs provide maintenance changes to OS/3 software that enhance system stability or forestall potential difficulties. Each SMP consists of several System Maintenance Changes (SMC). The SMCs may also be issued singly to meet individual user requirements.

Both SMPs and SMCs are installed interactively through the system console. Dialogs are available to assist the user in more complicated installations of SMPs.

SOFTWARE REQUIREMENTS

The System Control Software is the basis of the OS/3 Operating System; all other OS/3 software products require it for operation. It is always provided with an OS/3 software release.

HARDWARE REQUIREMENTS

The System Control Software will operate on any System 80, 90/25, 30, or 40 model and configuration that meets the minimal hardware configuration requirements for that specific model and satisfies the main storage requirements specified in the software release documentation accompanying each release.

SECTION II

CUSTOMER EDUCATION

Sperry Univac makes available customer education related to this Program Product. Course availability and schedules are contained in the published course catalog. Charges for courses will be at prevailing rates. Customers should contact their local Sperry Univac representative for enrollment procedures.

PROGRAM PRODUCT SUPPORT

Sperry Univac endeavors to correct any significant error in an unaltered current release of this Program Product that the customer brings to the attention of Sperry Univac in accordance with established correction procedures. Sperry Univac does not represent or warrant that all errors will be corrected. This error correction service may result, from time to time, in update releases that the customer will install. Sperry Univac reserves the right to alter the classification of this Program Product to reflect changes in policy or support requirements.

ORDERING INFORMATION

This Program Product and its associated documentation may be leased from Sperry Univac at separately stated lease charges. Upon execution of the appropriate Consolidated Agreement or Supplemental Agreement, the following will be provided:

1. A magnetic tape or diskette(s) in OS/3 Operating System format
2. One copy of the associated documentation