



## IBM System/34 System Support Program Product (SSP) Program Number 5726-SS1

The SSP (System Support Program Product) contains control programming functions for System/34. These functions are provided to support user application programs, other IBM program products, and IBM diagnostic and service aid programs. The SSP (in conjunction with control storage functions):

- Provides three ways to submit jobs from any display station for execution: OCL statements, command statements, and menus (OCL, command, and menu processing)
- Initiates jobs (job scheduler)
- Permits an operator to interrupt one program to execute another program (inquiry)
- Controls input and output on system devices (data management)
- Performs basic system functions, such as deleting or copying a file (SSP utility programs)
- Runs jobs concurrently (multiprogramming)
- Saves information for later printing instead of waiting for the printer to print (print spooling)
- Allows an operator to submit a job and continue work without waiting for the job to run (input job queue)
- Provides password security functions (password security)
- Prepares basic assembler, FORTRAN IV, or COBOL (PRPQ) language programs for execution (overlay linkage editor)
- Supports more than one program library (multiple library support)
- Communicates with a remote system or device (data communications)

### *OCL, Command, and Menu Processing*

The System/34 SSP processes OCL (operation control language) statements, command statements, and menus.

OCL statements provide the SSP with information about a job, such as which programs to run and which files to use.

Command statements are of two types: procedure commands and control commands. Procedure commands tell the SSP to run a procedure (a group of OCL statements) in user storage. Control commands control system and display station operations. No user storage is needed to perform these functions.

Menus permit an operator to select a number from a displayed list (menu) of possible jobs to be run. The SSP also provides a utility to create menus.

### *Job Scheduler*

The SSP supervises the execution of jobs on System/34 by starting (initiating) jobs and performing end-of-job processing.

The SSP supports single-program mode, in which one operator calls procedures sequentially and each program runs separately in main storage. (Print spooling can also be used in single-program mode.)

The SSP also supports multiprogram mode, in which multiple operators call procedures concurrently and multiple programs execute concurrently in main storage. (See *Multiprogramming* for a further description.) The system uses main storage as a series of 2,048-byte (2K) segments. Each program occupies as many of these segments (not necessarily contiguous) as it requires. The use of noncontiguous storage for a program has no effect on that program; it enables the system to use storage more effectively when executing in multiprogramming mode.

### *Inquiry*

Inquiry allows an operator to interrupt an executing interruptable program to execute another program. This other program could, for example, retrieve and display information from a data file. When the inquiry is completed, the operator can resume the execution of the original program at the point where it was interrupted.

### *Data Management*

Data management performs input and output operations for the disk, printer, binary synchronous communications (BSC), and display station. When a user program requires input or generates output, data management interfaces between the user program and the hardware to perform the desired operation(s).

Disk data management supports program access to indexed, direct, and sequential files on disk. A program can specify that multiple disk files are to share the same input/output buffer to save main storage. Also, multiple programs can share the same disk file.

Printer data management supports output operations for an IBM 5211 Printer and one or more IBM 5256 Printers. Programs can specify (via OCL) which printer to use. The differences between the printers are transparent to the program.

Work station data management supports input and output operations for IBM 5251 Display Stations. Programs can specify that a display screen format stored in a library be retrieved, that program data be merged, and that the resulting display text and commands be sent to a display station.

The SSP supports a maximum combination of eight IBM 5251 Display Stations and IBM 5256 Printers. Up to four may be directly attached to the IBM 5340 System Unit. Support of more than four of these devices requires the additional IBM 5250 Information Display System feature called Cable Thru.

The SSP requires a minimum of one IBM 5251 Display Station. This device is used as the system console and can also be used as a command work station.

The SSP also supports the IBM 1255 Magnetic Character Reader. An SSP routine permits application programs written in RPG II or basic assembler to control reading of document data and document stacker selection.

### *SSP Utility Programs*

The SSP utility programs perform many routine, but necessary, functions. Some utilities manage disk files and programs on disk. Other utilities initialize, copy, and manage files on diskettes. There are other utilities that control the security feature, format the display screen, and specify system information (such as the number of lines printed per page and the date).

### *Multiprogramming*

System/34, with the SSP, can run jobs concurrently via a capability called *multiprogramming*.

In System/34 multiprogramming, more than one program can reside in main storage at a time. While one program waits for input or output operations to complete, another program executes. To the people using the system, the programs appear to be executing simultaneously.

When all programs in main storage are waiting for some operation, and the next program to be executed requires more main storage than is available, the system can remove one or more programs from main storage and save them on disk (swap them out). The SSP can then start the next program in the main storage area formerly occupied by the swapped-out program(s). When the swapped-in (active) program finishes processing or waits, the system can swap that program to disk and return one of the waiting programs to main storage so that the waiting program can resume processing. The system need not assign the same main storage area(s) to a waiting program when the program is swapped back in for execution.

### *Print Spooling*

System/34 can save printer output on disk for later printing via an SSP capability called *print spooling*.

With print spooling, the system intercepts output intended for the system printer and stores it on disk (a faster process than printing). If two or more jobs run concurrently and each job generates output for the system printer, the system can (1) print the data from one job and spool the data from the other jobs, or (2) spool all jobs. Printing can be done concurrently or later. The system operator controls the printing of spooled data and can also request multiple copies of the printer output without running the job again.

### *Input Job Queue*

A display station operator can submit a job from a display station and then continue with other activities, without waiting for that job to execute. It is also possible for an executing OCL procedure to specify jobs to be executed from the input job queue. The input job queue is a list of jobs that have been requested by display station operators or by OCL procedures. The system operator controls the execution of the queued jobs, in sequence, or can prioritize processing as required.

### *Password Security*

Security passwords help prevent unauthorized persons from gaining access to the system. When using this capability, the display station operators must enter a password before they can operate the system. Each operator can be assigned a unique password.

### *Overlay Linkage Editor*

The overlay linkage editor prepares basic assembler, FORTRAN IV, or COBOL (PRPQ) programs for execution. Programs produced by these language processors require further processing before the system runs them. The overlay linkage editor performs this additional processing.

### *Multiple Library Support*

Multiple library support allows creation of separate libraries for storing programs. All programs of one type can be stored in a separate library; for example, all programs currently being developed and tested. This enables many programs with the same name to be stored on disk. Multiple library support also makes it easy to maintain multiple applications on disk, by assigning each application its own library or each user a unique library.

### *Data Communications*

Data communications support is in four areas:

- BSC support (for RPG II and basic assembler)
- MRJE utility
- Print utility for MRJE
- Forms Control Table utility for MRJE

Data communications on System/34 requires a communications adapter, which is an additional System/34 feature.

*BSC Support:* The System/34 SSP supports binary synchronous communications (BSC) programs written using the RPG II or Basic Assembler and Macro Processor program products. (Assembler macroinstructions are part of the basic assembler.) RPG II and the assembler macroinstructions support input and output over a communications line. The SSP provides the management for transmitting and receiving data.

BSC data transfers are possible between System/34 and:

- Another System/34 with basic assembler or RPG II
- IBM System/32 with basic assembler or RPG II
- IBM System/3 with RPG II, MLMP, or CCP
- IBM System/7 with MSP/7
- Operating System or Disk Operating System Basic Telecommunications Access Method (OS, OS/VS, DOS/VS, or DOS BTAM)
- IBM System/360 Model 20 Input/Output Control System for the Binary Synchronous Communications Adapter
- Operating System Telecommunications Access Method (OS or OS/VS TCAM)

- Operating System or Disk Operating System Virtual Telecommunications Access Method (OS/VS or DOS/VS VTAM)
- Customer Information Control System (CICS/DOS/VS, or CICS/VS)
- Information Management System (IMS/VS)
- IBM 3741 Model 2 Data Station or Model 4 Programmable Work Station
- IBM 3747 Data Converter
- IBM 5231 Data Collection Controller Model 2 (as an IBM 3741 Model 2 Data Station in transmit mode)
- IBM 3750 Switching System (World Trade only)

When communicating with a System/360 or a System/370, System/34 appears to that system as a System/3.

**MRJE Utility:** The MRJE utility included in the System/34 SSP uses BSC to communicate with the host system (as a System/3) over point-to-point switched or nonswitched communications lines via the communications adapter. System/34 MRJE is always considered to be the remote station.

MRJE allows submission of jobs to an IBM System/370 for processing by:

- RES under OS/VS1
- JES2 under OS/VS2
- JES3 under OS/VS2
- HASP II under OS/VS2
- ASP under OS/VS2
- VM/370 RSCS

Any job that can be entered into the host system from that system's locally attached and similarly functioning I/O devices can be entered through MRJE. Output can be returned to MRJE, routed to another remote terminal attached to the host system, or directed to the host's local I/O devices.

**Print Utility:** The System/34 SSP includes a print utility for the MRJE data communications utility. This utility prints punch output and printer output that was directed to the disk during an MRJE session. The print data that was directed to the disk contains carriage control information.

**Forms Control Table Utility:** The System/34 SSP includes a forms control utility, which builds a disk file containing forms control information for MRJE.

## Specified Operating Environment

### System Configuration

The IBM System/34 System Support Program Product runs on all models of IBM System/34 and supports all available System/34 features. The SSP requires a printer.

The SSP routines execute in main storage in one of the following areas (the amount of main storage required for each SSP routine is described in the appropriate reference publication):

- Resident nucleus: A reserved area of main storage used by the SSP routines to provide control program services and input/output buffers. The size of this area is variable in 2K-byte increments, depending on the system configuration and performance options selected. The minimum size required is 14K bytes. (The *IBM System/34 Planning Guide*, GC21-5154, describes this size in detail.)
- User area: That area of main storage not occupied by the resident nucleus. Some SSP routines execute in the user area. These SSP routines are loaded and executed as:
  - *Dedicated programs*, which must be run separately (a dedicated program must be the only program active).
  - *Swappable programs*, which are treated like user application programs and can be temporarily written to the disk (swapped out) to free main storage for use by another active program.
  - *Nonswappable programs*, which must remain in storage to provide control program services to one or more other active programs until those active programs finish processing.

The dedicated and the swappable programs require a minimum of 14K bytes of main storage. In addition, the nonswappable routines for BSC program support require a minimum of 6K bytes of user main storage.

The SSP routines reside on disk and require certain work areas and files on disk. The amount of disk space required for residence, work areas, and files is described in the *IBM System/34 Planning Guide*, GC21-5154.

*Programming Systems*

The SSP has no prerequisite programming.

**Warranty**

The System Support Program Product (SSP) is warranted to conform to its Licensed Program Specifications when shipped to the customer if properly used in the Specified Operating Environment.

Licensed Program Specifications may be updated from time to time and such updates may constitute a change in specifications.

Following the discontinuance of all program services, this program will be distributed on an "As Is" basis without warranty of any kind either express or implied.

Any other documentation with respect to this licensed program including any documentation referenced herein, is provided for information purposes only and does not extend or modify these specifications.

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