

**DISK ORIENTED SYSTEM/3 MODEL 10/MODEL 8  
5702-SC1**

**PURPOSE**

**IBM System/3 Disk System Management Programs:** The disk system management programs are designed to generate and maintain a disk resident system which facilitates the compilation, generation, and execution of programs. The disk resident system must reside on an IBM 5444 Disk Storage Drive.

**HIGHLIGHTS**

The management programs consist of a supervisor and a scheduler which provide the user with the advantages of:

- Reduced card handling.
- Automatic job-to-job transition.
- Selective retrieval of programs stored in object libraries on disk.
- Selective retrieval of programs and procedures stored in source libraries on disk.
- Functional ability of expanded core storage (program overlay).
- Support of ROLL IN/ROLL OUT capability - The ability to roll out a program during its execution, bring in an inquiry program to be executed and upon its completion, restart the original program. To use ROLL IN/ROLL OUT, a 5471 Printer-KeyBoard is required.
- Support of Dual Programming feature - Through the use of operations control and dual program loading features, an expanded version of the supervisor controls program initiation, execution, and termination asynchronously in each of two partitions. Neither the printer, 3881, MFCU and/or 1442 can be used by both program levels. Disk Data files may be shared, but only one program level may write to a shared file. The 5471 Printer-KeyBoard may be used by both program levels for either object program input/output or operations control information. Three programs which will not run in the Dual Program mode but can run in a dedicated mode with the Dual Program Supervisor are the Basic Assembler program (5702-AS1), the Utility program for the 1255 Magnetic Character Reader (5707-UT2), and the Library Maintenance program (5702-SC1).
- Data Management and I/O support for the control of Input/Output Services.
- Execution of programs from cataloged procedures - Operation Control Language Procedures can be cataloged in the Source Program Library and called by the scheduler at job execution time.

**DESCRIPTION**

**Library Maintenance Program:** Allows the user to produce, maintain, and service the system disk and the source and object program libraries. The libraries may reside on any 5444 Disk Storage Drive. The system residence must be on either the fixed or removable disk of Drive 1. The principle functions of the program are to add or delete the source programs, procedures, and object programs in the user's program libraries, to allocate or re-allocate disk space to the libraries, to display library contents, and to copy any or all of a library from one disk to another.

**Disk Utility Programs:** These programs are provided to allow the user to prepare and maintain his disks. They are:

- **Disk Initialization** - Performs surface analysis on the user's disk and formats the disk according to disk system management requirements.
- **Alternate Track Assignment** - Allows the user to assign an alternate track in place of a defective one and print the data content of the area in error.
- **Alternate Track Rebuild** - Permits the user to correct data on the assigned alternate track.
- **File and Volume Display** - Permits the user to display the entire contents of the volume table of contents on any disk or individually by file name.
- **File Delete** - Is one means for deleting temporary data files from a disk and the only means for the user to delete permanent data files from a disk.

**Copy/Dump Program:** This program supports both file-to-file copies (COPY) and volume-to-volume copies (DUMP).

The file copy routines provide the user with an easy to use method of creating a file backup on another disk, diskette, cards, tape, or printer. Additionally, it provides an easy method of moving files from one location to another, with both file limit modification and reorganization. The program supports one input and one output per execution. Disk input can be a sequential, indexed, or direct file.

A sequential file can be copied to an indexed file, and tape, card, and diskette files are supported for input and output. When copying a file, the printer may be specified in addition to other output. Records may be deleted from a file by specifying a deletion code and position within each record; these deleted records may be printed.

The volume copy function of the Copy/Dump Program copies an entire disk volume to another disk volume for backup.

The Copy/Dump Program allows for intermediate mountings of the output disk so that files and entire disk volumes may be copied on a one drive system. Intermediate mounting is only permitted for the 5444 Disk Storage Drive.

**1255 and 1419 Data Management:** SCP subroutines are supplied to perform device control and data management services for the 1255 and 1419 Magnetic Character Readers. The 1255 subroutine (SUBR08) and the 1419 subroutine (SUBR09) are used with a user-written RPG II or Assembler program, and are functionally equivalent to the mdls 12 and 15 1255 (SUBR08) and 1419 (SUBR09) SCP support.

**SPECIFIED OPERATING ENVIRONMENT**

**HARDWARE REQUIREMENTS**

**Minimum System Requirement:** The Disk System Control Programming operates on an IBM System/3 mdl 10 which includes as a minimum an IBM 5410 Processing Unit mdl A13 (12K bytes), an IBM 5424 MFCU mdl A1 or an IBM 1442 Card Read Punch mdl 6, an IBM 5203 Printer or 1403 Printer and an IBM 5444 Disk Storage Drive mdl 1.

A minimum System/3 mdl 8 includes an IBM 5408 Processing Unit mdl A14 (16K bytes), an IBM 5203 Printer, an IBM 5444 Disk Storage Drive mdl A1, and either an IBM 3741 Data Station directly attached or an IBM 5471 Printer-KeyBoard.

Additional main storage and disk capacity will be utilized if available. The following configurations require at least 16K bytes of main storage:

- Dual Programming and IBM 5445/5448 Disk Storage Drive
- Dual Programming and IBM 3410/3411 Magnetic Tape Subsystem

Certain other configurations may require a minimum system of more than 12K: (1) when the supervisor requirement is greater than 4K (see "Supervisor Sizes" at the end of the SCP writeup for mdl 10); or (2) when program products require it.

**SOFTWARE REQUIREMENTS (None)**

**DOCUMENTATION**

(available from Mechanicsburg)

*System/3 Model 8 Introduction (GC21-5114) ... System/3 Disk System Introduction (GC21-7510) ... System/3 Models 8 and 10 System Control Programming Reference Manual (GC21-7512) ... System/3 Model 8 Operator's Guide (GC21-7634) ... System/3 Model 10 Disk System Operator's Guide (GC21-7508) ... System/3 Models 8 and 10 Halt Guide (GC21-7540) ... System/3 Models 4, 6, 8, 10, and 12 System Generation Reference Manual (GC21-5126) ... System/3 Disk Concepts and Planning Guide, (GC21-7571) ... System/3 Models 12 and 15 1255 and 1419 Magnetic Character Readers Reference and Program Logic Manual (GC21-5132) ... System/3 Bibliography (GC20-8080).*

**REMOTE JOB ENTRY STATION**

(Feature #6004-#6006)

**PURPOSE**

The Disk version of the RJE Program provides the user with the same functional capabilities as the card version. Additional function to support the 5444 Disk Storage Drive as an RJE I/O device is included. The RJE support requires a logging device. Therefore, if the dual program feature is to be used and the non-RJE program requires use of the printer, an IBM 5471 printer-keyboard is required. This program is loaded and executed under control of Disk System Management programs.

**PERFORMANCE**

The RJE Work Station support requires a partition size of approximately 5,120 bytes of main storage.

**DOCUMENTATION**

(available from Mechanicsburg)

*Remote Job Entry Workstation Reference Manual (GC21-7531) ... System/3 Bibliography (GC20-8080).*

**MACROS FEATURE  
(Feature #6020-#6021)**

**PURPOSE**

This feature is applicable to System/3 model 8. The feature makes available to the user data management and input/output support for the control of input/output services through assembler languages. The I/O services are available to users of assembler languages through the system generation link processor (macro processor) in conjunction with the disk system input/output service macros. The keyword macro statements coded by the user are expanded by the macro process or using the macro prototype definitions. The expanded code is in a form that can be processed by an assembler. The macro processor is included in the user's system at the user's option.

**Disk-oriented System/3 mdl 10/mdl 8 (cont'd)**

The Macros feature (#6020-#6021) is made available to support the user who has requirements that are unsupported in other programming support and it is recommended that it be used only in that environment.

**SPECIFIED OPERATING ENVIRONMENT****HARDWARE REQUIREMENTS**

**Minimum System Requirements:** Same as for 5702-SC1.

**SOFTWARE REQUIREMENTS:** 5702-SC1.

**DOCUMENTATION**

(available from Mechanicsburg)

*System/3 Models 8, 10, and 12 System Control Programming Macros Reference Manual (GC21-7562) ... System/3 Bibliography (GC20-8080).*

**5445 DISK STORAGE DRIVE FEATURE  
(Feature #6022-#6023)****PURPOSE**

This feature is not applicable to System/3 model 8. The IBM 5445 Disk Storage Drive Feature provides support of the 5445 Disk Storage Drive as an input/output and data storage device. The 5445 Disk Storage Drive is not supported for either system or library residence.

**DESCRIPTION**

In addition to the disk system management functions, the following facilities are provided:

**Disk Utility Programs:** The Disk Utility Programs which are provided for the disk user to prepare and maintain his 5445 disks will include:

- Disk Initialization Utility
- Alternate Track Assignment Utility
- Alternate Track Rebuild
- Volume and File Display
- File Delete

**Copy/Dump Program:** This program provides the user with an easy-to-use method of copying a file or a complete disk backup on another disk. All features of the Copy/Dump Program for the 5445 are provided for the 5444 user with the exception that no intermediate mountings of the output pack on the 5445 are allowed for the COPYPACK function.

**5445 Data Interchange Utility Program:** This program is used prior to taking a 2316 Disk Pack from System/3 to System/360 or System/370 for processing, or prior to using the disk pack on System/3 after returning from System/360 or System/370. To use a 2316 Disk Pack in an interchange environment, it must have been initialized on System/3, and the interchange files must have been allocated on System/3. System/360 or System/370 OS or DOS may read, update, or in OS only, OUTPUT to these files, but may not create or extend them since OS and DOS do not create or update the System/3 Volume Table of Contents (VTOC).

**SPECIFIED OPERATING ENVIRONMENT****HARDWARE REQUIREMENTS**

**Minimum System Requirement:** In addition to the requirement of 5702-SC1, this feature requires an IBM 5445 Disk Storage Drive.

**SOFTWARE REQUIREMENTS:** 5702-SC1.

**MAGNETIC TAPE SUPPORT FEATURE  
(Feature #6024-#6025)****PURPOSE**

This feature is applicable to System/3 model 8. The Disk SCP Magnetic Tape Support feature provides support for magnetic tape as a data storage device on System/3 model 10. The features provided are:

- Fixed and variable length records
- Blocked and unblocked records
- Physical block size from 18 bytes to 32K bytes
- Multi-volume files
- Support for unlabelled or labelled (ANSI or IBM Standard labels) tapes
- ASCII and EBCDIC data support
- Tape Error Statistics

**DESCRIPTION**

**Tape Initialization Program:** Allows the magnetic tape users to create and delete standard tape volume labels, check for unexpired labels and to display existing volume and data file labels.

**Tape Error Summary Program:** Prints tape error statistics that have been accumulated during processing.

**Dump/Restore Program:** Provides capability for model 10 tape-disk configurations to obtain backup of disk packs. It copies an entire 5444 or 5445 or 5448 disk volume to tape and restores a disk from a tape previously created by this program. Some of the options supported are

7- or 9-track, EBCDIC only, one pack per tape reel but multiple reel files are supported, and requires only minimum main storage.

**SPECIFIED OPERATING ENVIRONMENT****HARDWARE REQUIREMENTS**

**Minimum System Requirements:** In addition to the requirements of 5702-SC1, this feature requires the IBM 3410/3411 Magnetic Tape Subsystem. All available features of these tape drives are supported by this feature.

**SOFTWARE REQUIREMENTS:** 5702-SC1.

**DOCUMENTATION**

(available from Mechanicsburg)

*IBM System/3 Magnetic Tape Program Planning Manual (GC21-5040) ... System/3 Bibliography (GC20-8080).*

**OVERLAY LINKAGE EDITOR AND CHECKPOINT/RESTART FEATURE  
(Feature #6026-6027)****PURPOSE**

This feature is applicable to System/3 model 8. The Overlay Linkage Editor facility creates loadable programs from multiple relocatable modules. Output from the Overlay Linkage Editor may be cataloged in the Object Library and/or punched into cards. Overlay structures may be created automatically or as designated by the user from relocatable program modules.

The Checkpoint facility provides the user with the ability to write checkpoint records when using problem programs that have Checkpoint/Restart capabilities. Restart provides the facility to resume the execution of programs from the last checkpoint rather than from the beginning, if processing is terminated via a machine failure or an operator-initiated immediate cancel.

This feature is a prerequisite for the Basic Assembler program (5702-AS1), Subset ANS COBOL (5702-CB1), and Disk FORTRAN (5702-F01).

**SPECIFIED OPERATING ENVIRONMENT****HARDWARE REQUIREMENTS**

**Minimum System Requirements:** Same as for 5702-SC1.

**SOFTWARE REQUIREMENTS:** 5702-SC1.

**DOCUMENTATION**

(available from Mechanicsburg)

*Overlay Linkage Editor Reference Manual (GC21-7561) ... System/3 Bibliography (GC20-8080).*

**BSCA MULTILINE/MULTIPOINT FEATURE  
(Feature #6030 or #6031)****PURPOSE**

The BSCA Multiline/Multi-point feature provides communications support when used in conjunction with the System/3 Macros feature #6020 or #6021. Configurations supported are point-to-point nonswitched, point-to-point switched and multipoint leased line with the System/3 as a multi-dropped terminal or control station. Also provided is the capability to operate two BSCA lines simultaneously on one System/3. The two BSCAs may have different configurations.

For a list of supported BSC devices and of the communications modes in which each device is supported (e.g., point-to-point, multipoint, etc.), see page M5408 or M5410. Support for the 3270 terminals via the Local Display Adapter (model 8 only) is also included.

Program counters will be maintained on the disk file to accumulate performance information per BSC line. Counters will be logged to the file at close time. A utility program will be provided to display the counters.

The BSCA IOS routines depend on the model 10 Disk System Control Programming (5702-SC1) for systems functions. Additional storage is required in the supervisor for support of BSCA. RPG II Telecommunications feature (5702-RG1) must not be used in the same RPG II generated program to which subroutines using the Multiline/Multi-point feature are linked.

**SPECIFIED OPERATING ENVIRONMENT****HARDWARE REQUIREMENTS**

**Minimum System Requirements:** The BSCA Multiline/Multi-point Feature requires for source program compilation the same minimum system as the IBM Disk model 10 System Control Programming (5702-SC1). For execution of an object program on the IBM 5410 Processing Unit using BSCA (#2074 or #2084) to control communication with multidropped terminals on a multipoint line, a minimum of 16K bytes of storage and a log device are required.

SYSTEM CONTROL PROGRAMMING

**Disk-oriented System/3 mdl 10/mdl 8 (cont'd)**

For execution of an object program on an IBM 5408 Processing Unit using either the ICA (#4645 with #6202 or #4801 or #4802) or the BSCA (#2074) to control communications with multi-dropped terminals on a multipoint line, a minimum model 8 System and a log device are required.

**SOFTWARE REQUIREMENTS**

5702-SC1, 5702-SC1 feature #6020/#6021; 5702-AS1 or its equivalent.

**DOCUMENTATION**  
(available from Mechanicsburg)

*System/3 Multiline/Multipoint Binary Synchronous Communications Reference Manual (GC21-7573) ... System/3 Bibliography (GC20-8080)*

**COMMUNICATIONS CONTROL PROGRAM**  
(Feature #6033)

**PURPOSE**

The Communications Control Program (CCP) feature provides control program services needed for telecommunications systems. The services are:

- High Level language (RPG II, COBOL, FORTRAN) access to MLTA, BSCA (including the Integrated Communications Adapter) and Local Display Adapter attached terminals.
- Program Fetch as a result of terminal operator request.
- Resource Management to reduce contention between programs accessing the same files, provide access to terminals and manage storage available for application programs.
- Concurrent program execution allowing multiple application programs within the available storage.
- Terminal Monitoring to accept data and terminal commands.
- Display Format Facility (DFF) which permits the support of 3270 systems with a minimum of coding in high level languages.

**DESCRIPTION**

**Terminals and Features Supported:** The following terminals may be used with the Communications Control Program:

- **Through the Multiple Line Terminal Adapter (MLTA) (model 10 only):**
  - 1050 Data Communication System  
Multipoint switched  
Multipoint nonswitched
  - 2740 Communication Terminal model 1  
Basic  
Checking  
Dial  
Dial with checking  
Dial with transmit control  
Dial with transmit control and checking  
Station control  
Station control with checking
  - 2740 Communication Terminal model 2  
Station control  
Station control with checking  
Station control with buffer receive  
Station control with buffer receive and checking
  - 2741 Communication Terminal  
Basic  
Switched
  - 3767 Communications Terminal  
Treated as a 2740 Communication Terminal (model 1 or 2) or as a 2741 Communication Terminal
  - Communicating Magnetic Card SELECTRIC® Typewriter (appears identical to a 2741)  
Point-to-point switched
  - System/7 (appears identical to a 2740 model 1)  
Checking  
Dial with checking  
Station control with checking
  - 5100 Portable Computer (appears identical to a 2741)

• **With the Binary Synchronous Communications Adapter (BSCA):**

- 3270 Information Display System  
Point-to-point nonswitched  
Multipoint nonswitched  
Point-to-point switched (3275 only)
  - 3735 Programmable Terminal  
Switched  
Multipoint nonswitched
  - 3741 Data Station model 2 and 3741 Programmable Workstation model 4  
Point-to-point (switched and nonswitched)  
Multipoint tributary
  - 5110 Computer (as a data mode CPU)  
Point-to-point (switched and nonswitched)  
Multipoint tributary
  - 5231 model 2 (appears as a 3741-2 or 4)  
Point-to-point (switched and nonswitched)  
Multipoint tributary
  - 5280 Distributed Data System  
Point-to-point (switched and nonswitched)  
Multipoint tributary
  - Series/1  
Switched  
Nonswitched point-to-point
  - System/3  
Switched  
Nonswitched point-to-point  
Multipoint control station  
Multipoint tributary
  - System/7  
Switched  
Nonswitched point-to-point  
Multipoint (System/3 is control station)
  - System/32  
Switched  
Nonswitched point-to-point  
Multipoint (System/3 is tributary)
  - System/34  
Switched  
Nonswitched point-to-point  
Multipoint (System/3 is control station)
  - System/360, System/370  
Switched  
Nonswitched point-to-point  
Multipoint (System/3 is tributary)
- **With the Local Display Adapter (model 8 only)**
- 3270 terminals only  
3277 Display Station (model 1 or 2)  
3284 Printers (model 1 or 2)  
3286 Printers (model 1 or 2)  
3288 Printer (model 2)

In addition to controlling terminals, the System/3 can operate as a tributary terminal (BSCA only) to a host System/360 or System/370. In this configuration, the System/3 is a sub-host controlling terminals, and is itself a terminal to another system.

**SPECIFIED OPERATING ENVIRONMENT**

**HARDWARE REQUIREMENTS**

**Hardware Requirements - IBM Model 10:** The following is the minimum hardware necessary for a communications-based information system using the Communications Control Program:

- IBM 5410 model A15 Processing Unit (24,576 bytes of main storage)
- IBM 5410 model A16 Processing Unit (32,768 bytes of main storage) if DFF is used to support an IBM 3270 Information Display System
- One IBM 5444 model 2 Disk Storage Drive
- IBM 5471 Printer-KeyBoard
- IBM 5424 Multi-Function Card Unit (MFCU) or IBM 1442 Card Read/Punch (required during CCP generation, but not required for operation)
- IBM 5203 or 1403 Printer (required during CCP generation, but not required for operation)
- Multiple Line Terminal Adapter RPQ (RPQs S40028 through S40033) or one Binary Synchronous Communications Adapter
- At least one communications terminal of a type listed under "Terminals and Features Supported".

With the above configuration, no more than one application program may be executing at a time. The minimum main storage size in which concurrent execution of more than one program is supported is 32,768

**Disk-oriented System/3 mdl 10/mdl 8 (cont'd)**

bytes (IBM 5410 model A16) and is 49,152 bytes (IBM 5410 model A17) if DFF is used to support the IBM 3270 Information Display System.

**Additional Hardware Supported - Model 10:** The following additional hardware facilities are supported by the Communications Control Program:

- Up to 49,152 bytes of main storage (65,536 bytes by RPO)
- IBM 5444 Disk Storage Drive model 2, 3, A01, A02, A03
- One or two IBM 5445 Disk Storage Drives (for data files only)
- IBM 5448 Disk Storage Drive model A1 (for data files only)
- Both 5424 MFCU and 1442 Card Read/Punch (by RPO)
- One directly attached 3741 Data Station/Programmable Workstation
- Two Binary Synchronous Communications Adapters and one Multiple-Line Terminal Adapter with up to eight lines
- Dual Program Feature (see Note)

**Note:** The Communications Control Program does not require the dual program feature to allow more than one program to be executed at a time. Use of the dual program feature is not prohibited during execution of the CCP, but any program executed in the other program level does not run under control of the CCP. The Communications Control Program cannot be run in both program levels concurrently.

**Hardware Requirements - Model 8:** The following is the minimum hardware necessary for a Model 8 CCP System.

- IBM 5408 model A16 (32K bytes)
- One IBM 5444 model A2 Disk Storage System
- IBM 5203 Printer (required during CCP generation, but not required for operation)
- IBM 5471 Printer-Keyboard
- Integrated Communications Adapter (#4645) and local/remote interface, or the Local Display Adapter
- At least one Communications terminal of a type listed under Terminals and Features Supported
- The minimum main storage size in which concurrent execution of more than one program is supported is 48K (IBM 5408 model A17) if DFF is used to support the IBM 3270 Information Display System.

**Additional Hardware Supported - Model 8:** The following additional facilities are supported by CCP on a model 8.

- Up to 64K bytes of Main Storage
- IBM 5444 Disk Storage Drive model A3 or a second model A2
- IBM 5448 Disk Storage Drive model A1 (for data files only)
- One Binary Synchronous Communications Adapter
- Dual Program feature (see note above under "Additional Hardware Supported - Model 10")
- One directly-attached IBM 3741 Data Station/Programmable Workstation

**Note:** MLTA and MLTA IOCS are not available for the model 8. Local Display Adapter is not available for the model 10.

**SOFTWARE REQUIREMENTS**

Execution of the Communications Control Program requires Disk System Management, including all modules for the appropriate IOCS.

A generation of the Communications Control Program requires Disk System Management, including:

- Macros feature (5702-SC1, feature #6020/#6021)
- Overlay Linkage Editor and Checkpoint/Restart feature (5702-SC1, feature #6026/#6027)
- The appropriate communications IOCS (program number 5799-WAU for MLTA and/or program number 5702-SC1, feature #6030/#6031, for the BSCA ML/MP feature)

No special programming systems requirements exist for the running of system assignments.

For the preparation of application programs, an applicable compiler or assembler is required.

**Program Prerequisites:** 5702-SC1; 5702-SC1, feature #6020/#6021; 5702-SC1, feature #6026/#6027; 5799-WAU and/or 5702-SC1, feature #6030/#6031.

**DOCUMENTATION**  
(available from Mechanicsburg)

*System/3 CCP Programmer's Reference Manual (GC21-7579) ... System/3 CCP Terminal Operator's Guide (GC21-7580) ... System/3 Models 8, 10, and 12 CCP System Operator's Guide (GC21-7581) ... System/3 Models 8, 10, and 12 CCP System Reference (GC21-7588) ... System/3 CCP Messages Manual GC21-5170 ... System/3 CCP General Information Manual (GC21-7578) ... System/3 Bibliography (GC21-8080).*

**3881 OPTICAL MARK READER FEATURE**  
(Feature #6034-#6035)

**PURPOSE**

Provides the user with system subroutines for data management and input control of the optical mark reader attached to System/3 model 10. These subroutines are used with the SPECIAL exit function of RPG II or with the Basic Assembler program.

**SPECIFIED OPERATING ENVIRONMENT**

**HARDWARE REQUIREMENTS**

**Minimum System Requirements:** In addition to the requirements for 5702-SC1, this feature requires an IBM 3881 Optical Mark Reader. This feature operates on a minimum IBM System/3 model 10 Disk System with 12K bytes of main storage and with the SIOC Feature. This feature is applicable to IBM System/3 model 8 and requires a minimum system and the SIOC.

**SOFTWARE REQUIREMENTS**

5702-SC1; 5702-RG1 or 5702-AS1.

**DOCUMENTATION**  
(available from Mechanicsburg)

*3881 Optical Mark Reader Model 1 Program Reference and Logic Manual (GC21-5103) ... System/3 Bibliography (GC20-8080).*

**MULTI-LEAVING REMOTE JOB ENTRY WORKSTATION PROGRAM**  
(Feature #6036-#6037)

**PURPOSE**

Permits a System/3 Disk System equipped with a Binary Synchronous Communications Adapter with EBCDIC (Text Transparency optional) to function as a Multi-leaving Remote Job Entry Workstation communicating over a point-to-point (switched or nonswitched) line to a System/370 operating under control of one of the following:

- HASP II (Version 3.1 or 4.0)
- ASP (Version 2.6 or 3.0)
- Remote Entry Services (RES) of JES under OS/VS1 Release 2
- Multi-leaving Workstation facilities of JES2/JES3 under OS/VS2 Release 2
- RSCS of VM/370

**DESCRIPTION**

Any job which can be entered into the central system from locally-attached similarly-functioned I/O devices can be entered from the System/3 MRJE Workstation. Workstation input may be read from any of the devices indicated below. Operator messages and output data sets may be directed to any of the devices shown below. Output may be returned to the submitting workstation or routed to another workstation or directed to local central system I/O devices. (Not all of these devices are available for System/3-8.)

	Input*	Messages	Output
5424 MFCU	x		x
1442 Card Read Punch	x		x
3741 directly attached	x		x
5471 Printer-Keyboard	x	x	
5203 Printer		x	x
1403 Printer		x	x
5444 Disk Storage Drive	x		x
5445 Disk Storage	x		x
5448 Disk Storage	x		x
3410/3411 Mag. Tape	x		x

\* Input may be from a combination of these devices.

All disk files created by the workstation program are standard System/3 consecutive files and may be accessed by any of the following programs: MRJE/WS

Print Utility, SCP Copy/Dump program, or user-written RPG II, COBOL, FORTRAN, or Assembler programs.

When using the Workstation program, the following restrictions apply:

- Column binary is not supported.
- Reading and punching OS object decks requires the BSCA Text Transparency feature and a 1442 Card Read Punch.
- For unit record devices (including the 3741), input record lengths can be 80 or 96 bytes; however, only the first 80 bytes of the input records will be processed by the Workstation program.
- Files processed with the READFILE command can contain records of other than 80 or 96 bytes. The file will be transmitted to the host central as 80-byte records. (Regrouping the data is the user's responsibility.)
- Print records which exceed the line length of the System/3 Printer will be truncated.

**Disk-oriented System/3 mdl 10/mdl 8 (cont'd)**

- The Workstation program requires a logging device.
- The 5471 Printer-Keyboard is required only if MRJE is an 'Inquiry' program.

**SPECIFIED OPERATING ENVIRONMENT**

**HARDWARE REQUIREMENTS**

**Minimum System Requirements:** In addition to the minimum requirements for 5702-SC1, this feature requires the BSCA (#2074) with EBCDIC. A minimum program level size of 8.5K bytes is required for execution.

This feature is applicable to System/3 model 8 and can use the Integrated Communications Adapter (#4645 & #6202) or BSCA (#2074).

**SOFTWARE REQUIREMENTS**

5702-SC1; 5702-SC1 feature #6026/#6027.

**DOCUMENTATION**

(available from Mechanicsburg)

*MRJE/WS Support Reference Manual (GC21-7621) ... System/3 Bibliography (GC20-8080).*

**IBM 3741 DATA STATION FEATURE  
(Feature #6066-#6067)**

**PURPOSE**

This feature provides support for the 3741 Data Station (model 1 or 2) and Programmable Workstation (model 3 or 4) as an input/output device directly attached to a System/3. For 3741 models 3 and 4, System/3 does not support the Application Control Language (ACL).

**SPECIFIED OPERATING ENVIRONMENT**

**HARDWARE REQUIREMENTS>**

**Minimum System Requirements:** In addition to the requirement for 5702-SC1, this feature requires a 3741 directly attached.

**SOFTWARE REQUIREMENTS: 5702-SC1.**

**DOCUMENTATION**

(available from Mechanicsburg)

*System/3 3741 Reference Manual (GC21-5113) ... System/3 Bibliography (GC20-8080).*

**5448 DISK STORAGE DRIVE FEATURE  
(Feature #6074)**

**PURPOSE**

The 5448 Disk Storage Drive on the System/3 models 8 and 10 is supported by the SCP as an input/output and data storage device. The 5448 is not supported for either system or library residence. Except for split cylinder files and offline multivolume files, the 5448 file organizations (sequential, indexed, and direct) and access methods are the same as for the 5445.

**Note:** To access files on the 5448, the RPG II compiler requires the Disk RPG II 5445 Disk Storage Drive feature (5702-RG1, feature #6014), and the Disk Sort program requires the Disk Sort 5445 Disk Storage feature (5702-SM1, feature #6010).

**Disk Utility Programs:** The Disk Utility Programs used to prepare and maintain the 5448 include the following:

**DESCRIPTION**

\$INIT	Disk Initialization
\$ALT	Alternate Track Assignment
\$BUILD	Alternate Track Rebuild
\$LABEL	File and Volume Label Display
\$DELETE	File Delete Program
\$COPY	Copy/Dump Program
\$DCOPY	Dump/Restore Program
\$PCOPY	Disk Pack Backup/Restore Program

**Copy/Dump Programs:** By using unit codes D1 and D2, \$COPY can be used to copy files or entire volumes. For the COPYFILE function, all the features for 5444 and 5445 copies are supported. Using the COPY-PACK function, a volume can be copied as follows: 5444 to 5444 ... 5448 to 5448.

**Dump/Restore Program:** By using the unit code D1 or D2, the \$DCOPY program can be used to dump a 5448 volume to magnetic tape for backup, or to restore a 5448 volume from a tape created by this program. It is not possible to restore a 5444 or 5445 tape to a 5448, nor is it possible to restore a 5448 tape to a 5444 or 5445.

**Disk Pack Backup/Restore Program:** The Disk Pack Backup/Restore Program (\$PCOPY) provides a method to backup a 5448 volume (D1 or D2) onto two 5440 disk cartridges and to restore a 5448 volume from two 5440 disk cartridges created by this program. When the 5440 disk cartridges contain a 5448 backup, they are protected and may only be accessed by \$PCOPY or \$INIT (using TYPE-CLEAR).

**SPECIFIED OPERATING ENVIRONMENT**

**HARDWARE REQUIREMENTS**

**Minimum System Requirements:** An IBM System/3 model 8 includes: IBM 5408 Processing Unit model A14 (16K bytes) ... IBM 5444 Disk Storage Drive model A2 ... IBM 5448 Disk Storage Drive model A1 ... plus other devices required for a model 8.

A System/3 model 10 includes: IBM 5410 Processing Unit model A13 (12K bytes) ... IBM 5444 Disk Storage Drive model 2 or A2 ... IBM 5448 Disk Storage Drive model A1 ... plus other devices required for a model 10 Disk System.

**SOFTWARE REQUIREMENTS: 5702-SC1.**

**DOCUMENTATION**

(available from Mechanicsburg)

*IBM System/3 5448 Disk Storage Drive Program Reference Manual (GC21-5168) ... System/3 Bibliography (GC20-8080).*

**SYSTEM/3 MODEL 10 DISK AND MODEL 8 SYSTEM SUPERVISOR SIZES**

The size of the Disk System supervisor varies depending on the configuration. The following table can be used for planning purposes.

Disk Drives**	Dedicated System		Dual Programming	
	w/ console	w/o console	w/ console	w/o console
R1,F1	3.00K	2.75K	3.75K*	3.50K*
R1,F1,R2	3.25K	3.00K	4.00K	4.00K
R1,F1,R2,F2	3.25K	3.00K	4.00K	4.00K
R1,F1,D1 (5445)	3.75K	3.75K*	4.75K	4.50K
R1,F1,D1,D2 (5445)	4.00K	3.75K	4.75K	4.50K
R1,F1,D1,D2 (5448)	4.75K	4.50K	5.50K	5.50K
R1,F1,R2,F2,D1 (5445)	4.00K	3.75K	4.75K	4.50K
R1,F1,R2,F2,D1,D2 (5445)	4.00K	3.75K	4.75K	4.50K
R1,F1,R2,F2,D1,D2 (5448)	4.75K	4.50K	5.75K	5.50K

**\*\*Notes:**

- K = 1024 bytes (decimal)
- R1,F1 = 5444 drive 1
- R2/R2,F2 = 5444 drive 2
- D1 = 5445 drive 1
- D1,D2 = 5448/5445 drive 1 and drive2

For tape support, add 0.50K to the above numbers.

For configurations indicated with an asterisk, add 0.75K instead of 0.50K.

For BSCA support (with LINE 1 and LINE 2, ICA, local display adapter or ML/MP), add 0.25K to the above numbers. ICA and display adapter are supported on the model 8 only. BSCA support is not required if only running MRJE, since MRJE supplies its own BSCA support.

For 3741 directly attached, add 0.75K to the above numbers.

**Multiple Program Requests:** System/3 Program Products and System Control Programming of program type 5702 which are ordered from PIDfor shipment at the same time may be shipped to the user stacked on a 5440 disk cartridge.

**MODEL 4 and MODEL 6 BASE SCP  
5703-SC1**

**PURPOSE**

These programs perform the system control functions that are basic to a commercially-oriented IBM System/3 model 6 installation, or to an IBM System/3 model 4 installation. They are designed to run on either a model 4 or a model 6, except as noted in the program descriptions.

**DESCRIPTION**

**Disk System Management Programs:** The disk system management programs are designed to generate and maintain a disk resident system which facilitates the compilation, generation, and execution of programs.

The management programs consist of a supervisor and a scheduler which provide the user with the advantages of:

- Automatic job-to-job transition.
- Selective retrieval of programs stored in object libraries on disk.
- Selective retrieval of programs and procedures stored in libraries on disk.
- Functional ability of expanded core storage (program overlay).
- Support of ROLL IN/ROLL OUT capability - the ability to roll out a program during its execution, bring in an inquiry program to be executed and upon its completion, restart the original program at point of interruption.
- Data Management and I/O Support for the control of Input/Output Services.
- Execution of programs from cataloged procedures - Operation Control Language Procedures can be cataloged in the Source Program Library and called by the scheduler at job execution time.

**Library Maintenance Program:** Allows the user to create, maintain, and service the source and object program libraries. The libraries may reside on any drive. The system residence must be on either the fixed or removable disk of Drive 1. The principle functions of the program are to add or delete the source programs, procedures, and object programs in the user's program libraries, to allocate or re-allocate disk space to the libraries, to display library contents, and to copy any or all of the library from one disk to another.

**Utility Programs:** These programs are provided to allow the user to prepare and maintain his disks.

They are:

- Disk Initialization Utility - Performs surface analysis on the user's disk and formats the disk according to disk system management requirements.
- Alternate Track Assignment Utility - Allows the user to assign an alternate track in place of a defective one and print the data content of the area in error.
- Alternate Track Rebuild - Permits the user to correct data on the assigned alternate track.
- File and Volume Display - Permits the user to display the entire contents of the volume table of contents on any disk or individually by file name.
- File Delete - Is one means for deleting temporary files from a disk and the only means for the user to delete permanent data files from a disk.

**Copy/Dump Program:** This program supports both file-to-file copies (COPY) and volume-to-volume copies (DUMP).

The file copy routines provide the user with an easy-to-use method of creating a file backup on another disk, diskette, cards, or printer. Additionally, it provides an easy method of moving files from one location to another, with both file limit modification and reorganization. The program supports one input and one output per execution. Disk input can be sequential, indexed, or direct file.

A sequential file can be copied to an indexed file, and card and diskette files are supported for input and output. When copying a file, the printer may be specified in addition to other output. Records may be deleted from a file by specifying a deletion code and position within each record; these deleted records may be printed.

The volume copy function of the Copy/Dump program copies an entire disk volume to another disk volume for backup.

The program allows for intermediate mountings of the output disk so that files and entire volumes may be copied on a one-drive system.

**SPECIFIED OPERATING ENVIRONMENT**

**HARDWARE REQUIREMENTS**

An IBM System/3 model 4 workstation system includes: IBM 5404 Processing Unit model A18 (64K bytes) ... IBM 5447 Disk Storage and Control ... IBM 5213 Printer ... IBM 3277 Display Station model 1 ... at least one locally attached terminal. (Note: The IBM 3277 is supported only by CCP; the Base SCP does not use the 3277.)

A minimum IBM System/3 model 6 configuration includes: IBM 5406 Processing Unit model B2 (8K bytes) ... IBM 5444 Disk Storage Drive ... IBM 5213 Printer or 2222 Printer.

**Devices Supported:**

Model 4	Model 6	Description
	X	129 Card Recorder model 1, 2 or 3
	X	2222 Printer model 1 or 2
	X	2265 Display Station model 2 (5406-B3 or B4 is required)
	X	5213 Printer model 1, 2 or 3
X		5213 Printer model 3
X		5404 Processing Unit model A18
	X	5406 Processing Unit model B2, B3 or B4
	X	5444 Disk Storage Drive model 1, 2 or 3
X		5447 Disk Storage and Control model A1 or A2
	X	5496 Data Recorder model 1

**SOFTWARE REQUIREMENTS:** None

**DOCUMENTATION**

(available from Mechanicsburg)

*System/3 Model 4 Introduction (GC21-5146) ... System/3 Models 4 and 6 Operation Control Language and Disk Utility Programs Reference Manual (GC21-7516) ... System/3 Model 4 Operator's Guide (GC21-5149) ... System/3 Model 6 Operator's Guide (GC21-7501) ... System/3 Models 4 and 6 Halt Guide (GC21-7541) ... System/3 Models 4, 6, 8, 10, and 12 System Generation Reference Manual GC21-5126) ... System/3 Disk Concepts and Planning Guide GC21-7571 ... System/3 Bibliography (GC20-8080).*

**OVERLAY LINKAGE EDITOR FEATURE  
(Feature #6010-#6011)**

**PURPOSE**

The Overlay Linkage Editor facility creates loadable programs from multiple relocatable modules. Output from the Overlay Linkage Editor may be cataloged in the Object Library and/or (model 6 only) punched into cards or written to diskette. Overlay structures may be created automatically or as designated by the user from relocatable program modules.

This feature is a prerequisite for Disk FORTRAN IV (5703-F01), for CCP/Disk Sort program (5703-SM2) and for the DFGR and PFGR functions of CCP (5703-SC1, feature #6033).

**SPECIFIED OPERATING ENVIRONMENT**

**HARDWARE REQUIREMENTS**

**Minimum System Requirements:** Same as for 5703-SC1, except that for IBM System/3 model 6, an IBM 5406 Processing Unit model B3 or B4 is required.

**SOFTWARE REQUIREMENTS:** 5703-SC1.

**DOCUMENTATION**

(available from Mechanicsburg)

*Overlay Linkage Editor Reference Manual (GC21-7561) ... System/3 Bibliography (GC20-8080).*

**MULTI-LEAVING REMOTE JOB ENTRY  
WORKSTATION PROGRAM  
Feature #6014-#6015**

**PURPOSE**

Permits a System/3 Model 4 or Model 6 equipped with a Binary Synchronous Communications Adapter with EBCDIC (Text Transparency optional) to function as a MULTI-LEAVING Remote Job Remote Job Entry Workstation communicating over a point-to-point (switched or nonswitched) line to a System/370 operating under control of one of the following:

- HASP II (Version 3.1 or 4.0)
- ASP (Version 2.6 or 3.0)
- Remote Entry Services (RES) of JES under OS/VS1 Release 2
- Multi-leaving Workstation facilities of JES2/JES3 under OS/VS2 Release 2

**DESCRIPTION**

Any job which can be entered into the central system for locally-attached, similarly-functioned I/O devices can be entered from the System/3 RJE Workstation. Workstation input may be read from any of the devices indicated below. Operator messages and output data sets may be directed to any of the devices shown below. Output may be returned to the submitting workstation or routed to another workstation or directed to local central system I/O devices.

SYSTEM CONTROL PROGRAMMING

System/3 Mdl 4 and Mdl 6 Base SCP (cont'd)

	Input*	Messages	Output
Console Keyboard	x		
5496 Data Recorder	x		x
129 Card Data Recorder	x		x
3741 directly attached	x		x
5213 Printer		x	x
2222 Printer		x	x
5444 Disk Storage Drive	x		x
5447 Disk Storage & Control	x		x

\* Input may be from a combination of these devices.

All disk files created by the workstation program are standard System/3 consecutive files and may be accessed by any of the following programs: MRJE/WS Print Utility, SCP Copy/Dump program, or a user-written RPG II or FORTRAN programs.

When using the MULTI-LEAVING Workstation program, the following restrictions apply: Column binary is not supported; OS object decks cannot be read or punched; only the first 80 bytes of input records will be processed by the Workstation program; input record lengths cannot exceed 96 bytes.

**SPECIFIED OPERATING ENVIRONMENT**

**HARDWARE REQUIREMENTS**

Same as for 5703-SC1, except that for System/3 model 6, an IBM 5406 Processing Unit model B3 or B4 is required. For either IBM System/3 model 4 or System/3 model 6, a BSCA (#2074) with EBCDIC is required.

**SOFTWARE REQUIREMENTS**

5703-SC1; 5703-SC1 feature #6010/#6011.

**DOCUMENTATION**

(available from Mechanicsburg)

*MRJE/WS Support Reference Manual (GC21-7621) ... System/3 Bibliography (GC20-8080).*

**IBM 3741 DATA STATION FEATURE  
Feature #6026-#6027)**

**PURPOSE**

This feature provides support for the IBM 3741 Data Station (model 1 or 2) and Programmable Workstation (model 3 or 4) as an input/output device directly attached to the System/3. For IBM 3741 models 3 and 4, the IBM System/3 does not support the Application Control Language (ACL).

This feature is not supported for System/3 model 4.

**SPECIFIED OPERATING ENVIRONMENT**

**HARDWARE REQUIREMENTS**

Minimum System Requirements: In addition to the requirement for 5703-SC1, this feature requires at least 12K of main storage and a 3741 directly attached.

**SOFTWARE REQUIREMENTS: (5703-SC1).**

**DOCUMENTATION**

(available from Mechanicsburg)

*System/3 3741 Reference Manual (GC21-5113) ... System/3 Bibliography (GC20-8080).*

**COMMUNICATIONS CONTROL PROGRAM  
Feature #6033 (model 4 only)**

**PURPOSE**

The IBM System/3 model 4 Communications Control Program (CCP) provides control program services needed for local or remote communication with workstations.

The services are:

- RPG II access to terminals attached to the CPU and to the Binary Synchronous Communications Adapter (BSCA).
- Program Fetch as a result of terminal operator request.
- Resource Management to reduce contention between programs accessing the same files, provide access to terminals and manage storage available for application programs.
- Concurrent program execution allowing multiple application programs within the available storage.
- Terminal Monitoring to accept data and terminal commands.
- Display Format Facility (DFF) which permits the support of 3270 systems with a minimum of coding in RPG II.

**Terminals and Features Supported:** The following terminals may be used with the Communications Control Program:

**Directly To The CPU**

- 3270 terminals only
- 3277 Display Station (model 1 or 2)
- 3284 Printer (model 1 or 2)
- 3286 Printer (model 1 or 2)
- 3288 Printer (model 2)

Note: A maximum of 5 terminals may be attached to the CPU.

**With the Binary Synchronous Communications Adapter (BSCA)**

- 3270 Information Display System
  - Point-to-point nonswitched
  - Multipoint nonswitched
  - Point-to-point switched (3275 only)
- 3735 Programmable Terminal
  - Switched Multipoint
- 3741 Data Station model 2 and 3741 Programmable Workstation model 4
  - Point-to-point (switched and nonswitched)
  - Multipoint tributary
- IBM 5110 Computer System (as a data mode CPU)
  - Point-to-point (switched and nonswitched)
  - Multipoint tributary
- 5231 model 2 (appears identical to 3741 model 2 or 4)
  - Point-to-point (switched or nonswitched)
  - Multipoint tributary
- IBM 5280 Distributed Data System
  - Point-to-point (switched and nonswitched)
  - Multipoint Tributary
- Series/1
  - Switched
  - Nonswitched point-to-point
- System/3
  - Switched
  - Nonswitched point-to-point
  - Multipoint control station
  - Multipoint tributary
- System/7
  - Switched
  - Nonswitched point-to-point
  - Multipoint (System/3 is control station)
- System/32
  - Switched
  - Nonswitched point-to-point
  - Multipoint (System/3 is control station)
- System/34
  - Switched
  - Nonswitched point-to-point
  - Multipoint (System/3 is control station)
- System/360, System/370
  - Switched
  - Nonswitched point-to-point
  - Multipoint (System/3 is tributary)

In addition to controlling terminals, the System/3 can operate as a tributary terminal (BSCA only) to a host System/360 or System/370. In this configuration, the System/3 is a sub-host controlling terminals and is itself a terminal to another system.

**SPECIFIED OPERATING ENVIRONMENT**

**HARDWARE REQUIREMENTS**

Minimum System Requirements: The Communications Control Program requires an IBM System/3 model 4 which includes an IBM 5404 Processing Unit model A18 (64K bytes)... An IBM 5447 Disk Storage and Control... An IBM 5213 model 3 Printer... An IBM 3277 model 1 Display Station (for CCP messages)... and one of the devices listed under "Terminals and Features Supported".

**SOFTWARE REQUIREMENTS**

Since CCP is pre-generated by IBM, to install CCP the user simply copies one of two versions from the distribution disk cartridge.



SYSTEM CONTROL PROGRAMMING

**System/3 Mdl 4 and Mdl 6 Base SCP (cont'd)**

Execution of CCP requires the System Control Programming (5703-SC1).

No special programming systems requirement exists for the running of system assignments. The use of the Display Format Generator routines and the Printer Format Generator routines require the Overlay Linkage Editor (5703-SC1, feature #6011).

For the preparation of application programs, the RPG II Compiler (5703-RG1) is required. For the preparation of sort jobs to be run under control of CCP, the CCP/Disk Sort program (5703-SM2) is required.

**SOFTWARE REQUIREMENTS**

5703-SC1; 5703-SC1 feature #6011.

**COMPATIBILITY**

This Communications Control program is upward compatible with with the CCP for the model 8 and 10 (5702-SC1, feature #6033). The interface between the system and the operator is different from that of the model 8 or 10.

**DOCUMENTATION**

(available from Mechanicsburg)

*Model 4 Introduction* (GC21-5146) ... *Model 4 CCP Concepts and System Design Guide* (GC21-5148) ... *Model 4 CCP Programmer's Reference Manual* (GC21-5150) ... *Model 4 Operator's Guide* (GC21-5149) ... *Terminal Operator's Guide*, (GC21-7580) ... *CCP Messages Manual* (GC21-5170) ... *System/3 Bibliography* (GC20-8080).



**SYSTEM CONTROL PROGRAMMING**
**SYSTEM/3 MODEL 15  
SYSTEM CONTROL PROGRAMMING  
5704-SC1, 5704-SC2**
**PURPOSE**

These programs perform the system's control functions for the installation. They are supplied by IBM with the system at no additional charge.

System Control Programming (SCP) must be ordered from PID prior to Order Confirmation (OC) time.

**DESCRIPTION**

The SCP consists of Disk System Management, System Control Programs, and System Service Programs. Operation of the system is by means of Operator Control Commands (OCC) and Operation Control Language (OCL) statements. Libraries on disk store object programs, source programs and OCL procedures.

SCP 5704-SC1 is designed to support model 15A, 15B and 15C. Model 15A has 5444 Disk Storage Drives and, optionally, 5445 Disk Storage. Models 15B and 15C have the 3340 Direct Access Storage Facility. SCP 5704-SC2 is designed to support model 15D, which has the 3340 Direct Access Storage Facility and, optionally, the 3344 Direct Access Storage.

For 5704-SC1, the SCP and libraries must reside on a 5444 or 3340. System residence (pack or area from which Initial Program Load occurs and which contains the SCP library) must be on drive 1. The user libraries may reside on either of the 5444 drives or on drive 1 or 2 of a 3340.

On the 3340, programs are stored in special areas on a 3348 data module called 5444 simulation areas. Each 5444 simulation area is large enough to contain data from one 5440 disk cartridge. Two 5444 simulation areas on a data module mounted on 3340 drive 1 can be used by system programming and are referred to as R1 and F1. Two 5444 simulation areas on a data module mounted on drive 2 can be used by system programming and are referred to as R2 and F2. Use of these areas for program residence is the same as an actual 5444 disk storage drive.

For 5704-SC2, the SCP and libraries must reside on a 3340 or 3344. System residence can be on drive 1 (3340) or drive 3 (3344 only). The user libraries may reside on any drive.

On the 3340 or 3344, programs are stored in 5444 simulation areas. However, assignments of these areas can be made by the user.

On the 3344 (model 15D only) each drive contains four main data areas and eight 5444 simulation areas. The main data areas are supported in similar fashion to those on a 3348 data module. A simulation area on drive 1 (3340) or drive 3 (3344 only) is set by IPL as F1 (or R1) by the user and can be used for system programming by the three partitions. Then, from three to nine additional simulation areas can be referred to as R1 (or F1), F2 and R2 by the three partitions. The designation of units (except for IPL unit) as F1, R1, F2 and R2 is accomplished by partition OCL assignment.

Both data files and program libraries can reside on a 5444. Only data files can reside on a 5445; programs can be stored in data files on a 5445, but to use them, they must be cataloged into the 5444 library. On a 3340 or 3344, data files reside in the main data area, and libraries reside in 5444 simulation areas.

System/3 model 15 differs from other System/3 models in these ways:

- Support of different devices and features
- Multiprogramming
- Spooling of a unit record input and/or output
- Different Operator Interface

**Disk System Management:** The Disk System Management consists of a supervisor, scheduler and data management facilities for operation and support of the system and for execution of user programs. Highlights include:

- Automatic Job-to-Job transition in any partition.
- Selective retrieval of object programs, source programs, and procedures from libraries on disk.
- Execution of programs by using cataloged procedures - OCL procedures can be cataloged in the library and called by the scheduler at execution time.
- Support of ROLLOUT/ROLLIN capability - The ability to roll out a program during its execution, bring in an inquiry program to be executed and upon its completion, restart the original program. ROLLOUT/ROLLIN is supported by RPG II, COBOL, and FORTRAN, and is available to Assembler users; it is not supported for Sorts, Utilities and System Control and Service Programs. (ROLLOUT/ROLLIN is supported in Partition 1 only and is not supported by 5704-SC2.)

- Support of Checkpoint/Restart capability - The ability to write checkpoint records when using problem programs that have Checkpoint/Restart capabilities (such as COBOL). Restart provides the facility to resume the execution of programs from the last checkpoint rather than from the beginning, if processing is terminated via a machine failure or an operator initiated immediate cancel. (Checkpoint/Restart is supported in Partition 1 only and, using 5704-SC2, checkpointed programs must be 48K or less and must not be using file sharing or external buffers.)
- The Tape Sort program supports Checkpoint/Restart but uses its own routines rather than the system routines.
- CRT/Keyboard simplifies operational control and speeds communications between the operator and the system.
- New halt approach - The need for operator intervention when system errors are encountered is reduced to a minimum through the use of system assigned automatic error defaults. The user has the flexibility of being able to specify the severity level of errors that he wishes his operator to control.
- Reduced system overhead—Improved transient handling, reduced interpartition interlock time and faster operator communication with the CRT should reduce system overhead (i.e., time required for such functions as initiate/terminate, open/close, allocate) as compared with the model 10.

The Interval timer - a standard feature on all 5415 Processing Units - is supported in one of the following levels:

- The time-of-day function is used by the system to time-stamp certain messages in the System History Area, and it can be used in application programs written in RPG II, COBOL, FORTRAN or Assembler.
- Full timer support, in addition to the time-of-day function, allows the user to time intervals.

**Multiprogramming**

- System/3 model 15 allows the concurrent execution of one user program in each of the two program partitions (5704-SC1) or three program partitions (5704-SC2). Programs share the CPU facilities, thus reducing the time that the system is in an unproductive waiting state.
- The supervisor controls priority for CPU processing, giving one partition priority over the other partition. All programs operate with interrupts enabled - when an interrupt occurs, the supervisor gains control, processes the interrupt, and gives control to the highest priority program that is in a ready state. Control is given up by a high priority program when it encounters a condition that prevents further processing. Control is taken away from a lower priority program at the completion of an event for which the higher priority program is waiting.

**Spooling**

- Spooling uses either a 5445 or a main data area on a 3340/3344 for intermediate storage of unit record input and output. It allows a single input or output device to serve all partitions.
- Spooling increases throughput by reducing the time the CPU waits for the completion of unit-record I/O operations. With spooling, the unit-record input and output is performed at disk I/O speed. A job's normal punched-card input (including operation control statements) is read from the card reader and stored on disk in an input queue before the start of the job. Similarly, a job's output is stored on disk in an output queue and printed and/or punched at a later time.
- One of the following levels of spooling support may be selected during system generation: Printing only ... printing and punching ... printing and input ... printing, punching and input. The selected level of support may be used in any or all partitions.
- The following devices are supported for spooling input and/or output: MFCU1, MFCU2, MFCM1, MFCM2, 1442, 2501, 1403. The 3741 directly attached is supported by spooling as an input device.

**Data Management:** Data Management routines provide an interface between the user program and the required data file(s). Data Management services are provided for disk files, tape files, card files, diskette files, printer files, and CRT files. In addition, a device-independent access method is supported.

**Disk Data Management:** Records may span physical disk boundaries (sectors, tracks, cylinders); the user need not be aware of the physical boundaries when he writes programs to access the data. Record sizes may range from 1 byte to 64K bytes, although a particular program (such as RPG II) may restrict the maximum size. The fixed length records may be blocked or unblocked for processing, and the blocking factor may vary from program to program.

**System/3 Model 15 SCP (cont'd)**

The following table shows the file organizations and maximum number of files for the 5444, 5445, 3340, and 3344.

File Organizations Supported				
	Sequential	Indexed	Direct	Number of Files (Max)
5444 disk	X	X	X	50
5445 disk	X	X	X	50 or 1000
3340 data module				
Main data area	X	X	X	1000
Simulation area	X	--	X	50
3344 disk				
Main data area	X	X	X	1000
Simulation area	X	--	X	50

A file may be large enough to require more than one disk pack. Multivolume sequential or indexed files may be online (all volumes mounted during file allocation) or offline (all volumes not necessarily mounted during file allocation); multi-volume direct files must be online. Offline multi-volume files are not allowed on the IPL drive. Multi-volume files are not supported under CCP, and they cannot be shared.

External buffers (5704-SC2 only): An optional data management technique allows disk I/O buffers to be outside of the object program but within the partition.

File Sharing: Both SCPs allow the sharing of a disk file between partitions. However, 5704-SC2 has very few restrictions compared with 5704-SC1.

Standard System/3 disk labels are mandatory for all disk files. Data and labels are stored as 8-bit bytes on disk.

Tape Data Management: The 3410/3411 Magnetic Tape Subsystem is supported by data management. Magnetic tape is used as a data storage medium only; libraries and programs are not supported on tape, but they can be contained in data files on tape. The following features are supported by the SCP tape data management routines:

- Fixed or variable length records
- Blocked or unblocked records
- Physical block size from 18 bytes to 32K bytes
- Multi-volume files
- Multi-file volumes
- Unlabeled or labeled (ANSI or IBM Standard labels) tapes. (Non-standard labels on input will be bypassed.)
- Recording format: EBCDIC or ASCII
- Tape Error Statistics

Tape support is functionally equivalent to tape support on other System/3 models, except that only the model 15 supports multi-file tape volumes.

**Card I/O Data Management**

5424 MFCU - read 96 columns ... punch 96 columns ... print ... feed ... deferred punch or print ... stacker select ... single or double buffering ... combined file processing ... 64 EBCDIC characters for read, punch, or print ... same as model 10 support.

2560 MFCM - read 1-80 columns ... punch 1-80 columns ... print 1-64 positions on 1-6 lines ... feed ... stacker select ... single or double buffering ... deferred punch or print ... combined file processing ... 256 EBCDIC characters for read or punch; 64 characters for print.

1442 - read 80 columns ... punch 1-80 columns ... read card image (column binary) ... feed ... stacker select ... single or double buffering ... combined file processing ... 256 EBCDIC characters for read or punch (except for card image mode) ... same as model 10 support.

2501 - read 1-80 columns ... read card image (column binary) ... single or double buffering ... 256 EBCDIC characters (except for card image mode).

**Diskette Data Management**

3741 Directly attached - read 1-128 characters ... write 1-128 characters ... single or double buffering ... 256 EBCDIC characters ... support similar to card I/O support ... for 3741 models 3 and 4, does not support the Application Control Language (ACL).

**Printer Data Management**

1403 - print 132-character line ... skip to line number before or after print ... space 0, 1, 2, or 3 before or after print ... page overflow detection ... Universal Character Set ... same as model 10 support.

3284 - print 120-, 126-, or 132-character line ... skip to line number before or after print ... space 0, 1, 2, or 3 before print ... space 1, 2, or 3 after print ... page overflow detection ... 64 EBCDIC character set.

CRT/Keyboard Data Management: The 3277-1 Display Station is supported for output records, and in conjunction with the 78-key Operator Console Keyboard, for input and update records. The top 7 lines (each 40 characters) of the CRT screen are used, to a maximum area of 279 positions (the last position of this area is reserved for system use). Data can be displayed using any of the 64 EBCDIC

characters allowed by the 3277. The program function keys 1-9 can be individually allocated by user programs.

Device Independent Data Management: A sequential file that uses Device Independent Data Management can be assigned at program execution time to one of the following devices: 1403, 3284, 5424, 2560, 1442, 2501, 3741 directly attached, 5444, 5445, 3340, 3344 or 3410/3411.

The following functions are supported: Double buffering, MFCU card printing, fixed length record processing, multi-volume tape file processing, and support of EBCDIC formats.

The following functions are not supported: stacker selection, forms control, record updating, record addition, combined file processing, multi-volume disk file processing, variable-length record processing, deferred opening of tape files, and support of ASCII formats.

Communications Management: Five communications interfaces are provided: RPG II Telecommunications (BSCA) support, RPG II 3270 Display Control Feature, BSCA Multiline/Multipoint (ML/MP) support, Multiple Line Terminal Adapter (MLTA) IOCS, and the Communications Control Program. The Terminal Support Chart shows the terminals supported by each interface. Refer to System/3 model 15 RPG pages for information on RPG II support. The MLTA IOCS is provided as a PSHRPO and the Communications Control Program is an SCP feature.

BSCA Multiline/Multipoint Support: Configurations supported are point-to-point nonswitched, point-to-point switched and multipoint leased line with the System/3 as a multi-dropped terminal or a control station. Also provided is the capability to operate two BSCA lines simultaneously on one System/3. The two BSCAs may have different configurations. For a list of BSC devices and of the communications modes in which each device is supported (e.g., point-to-point, multipoint, etc.), see M5415 page. Support for 3270 terminals via the Display Adapter (#4601) is also included.

Program counters are maintained on disk to accumulate performance information per BSC line. Counters are logged at CLOSE time. A utility program allows the counters to be displayed.

RPG II Telecommunications Specifications must not be used in the same RPG II program to which subroutines using Multiline/Multipoint support are linked.

For compilation, ML/MP requires the SCP, including the macros, and requires an Assembler.

Other I/O Data Management: Two different SCP subroutines (SUBR07 and SUBR08) are supplied to perform device control and data management services for the 1255 Magnetic Character Reader. Each subroutine is used with a user-written RPG II or Assembler program.

An SCP subroutine (SUBR09) is supplied to perform device control and data management services for the 1419 Magnetic Character Reader. The subroutine is used with a user-written RPG II or Assembler program.

An SCP subroutine is supplied to perform device control and data management services for the 3881 Optical Mark Reader. The subroutine is used with a user-written RPG II or Assembler program and is functionally equivalent to the model 10 3881 feature.

SYSTEM CONTROL PROGRAMMING

System/3 Model 15 SCP (cont'd)

TERMINAL SUPPORT CHART FOR SYSTEM/3 MODEL 15

Terminals Operating with S/3-15	Type Comm (1)	Programming Support				Communication Code (2)					Communication Network (3)			
		RPGII	MLMP	MLTA	CCP	EBCDIC		ASCII		PTTC	Point-to-Point		Multi-Point Trib	Ctrl Stat
						Nor	Tran	Nor	Tran		Sw	Nonsw		
1050	SS	-	-	X	X	-	-	-	-	X	X	X	-	X
2740 mdl 1	SS	-	-	X	X	-	-	-	-	X	X	X	-	X
2740 mdl 2	SS	-	-	X	X	-	-	-	-	X	-	X	-	X
2741	SS	-	-	X	X	-	-	-	-	X	X	X	-	-
3767 (as 274X)	SS	-	-	X	X	-	-	-	-	X	X	X	-	X
5100/5110 (as a 2741)	SS	-	-	X	X	-	-	-	-	X	X	X	-	-
CMCST	SS	-	-	X	X	-	-	-	-	X	X	-	-	-
S/7 ACC	SS	-	-	X	X	-	-	-	-	X	X	X	-	X
5100 (Note 7)	SS	-	-	X	X	-	-	-	-	X	X	X	-	-
S/360 & 370	BSC	X	X	-	X	X	X	X	-	-	X	X	X	-
S/360 mdl 20	BSC	X	X	-	X	X	X	X	-	-	X	X	-	-
1130 (Note 5)	BSC	X	-	-	-	X	X	-	-	-	X	X	-	-
2780	BSC	X	X	-	-	X	X	X	-	-	X	X	-	-
2770	BSC	X	X	-	-	X	X	X	-	-	X	X	-	-
S/7	BSC	X	X	-	X	X	X	X	-	-	X	X	-	X(4)
2972 mdls 8,11	BSC	-	X	-	-	X	-	-	-	-	-	-	-	X
3735	BSC	-	X	-	X	X	-	X	-	-	X	-	-	X
S/3	BSC	X	X	-	X	X	X	X	-	-	X	X	X	X(4)
3270	BSC	-	X	-	X	X	-	X	-	-	X(6)	-	-	X
3600 (Note 5)	BSC	-	X	-	X	X	X	-	-	-	-	-	-	X
3741 mdls 2, 4	BSC	X	X	-	X	X	X	-	-	-	X	X	-	X(4)
Series/1	BSC	X	X	-	X	X	X	X	-	-	X	X	-	-
S/32 & S/34	BSC	X	X	-	X	X	X	X	-	-	X	X	-	X(4)
5280 (as a 3741)	BSC	X	X	-	X	X	X	X	-	-	X	X	-	X(4)
5110	BSC	X	X	-	X	X	X	-	-	-	X	X	-	X(4)
5231 mdl 2 (as a 3741)	BSC	X	X	-	X	X	-	-	-	-	X	X	-	X(4)
6670 (as a 2770)	BSC	X	X	-	-	X	X	X	-	-	X	X	-	X

Legend:

- X = Supported
- = Not Supported

Notes:

1. Type Comm - Type of Communication
  - SS = Start/Stop
  - BSC = Binary Synchronous Communication
2. Communication Code (as supported by System/3 model 15)
  - Nor = Normal
  - Tran = Transparency
  - PTTC = Paper Tape Transmission Code
3. Communication Network
  - Point-to-Point Switched (Sw)
  - Point-to-Point Nonswitched (Nonsw)
  - Multipoint, System/3 as a tributary station (Trib)
  - Multipoint, System/3 as a control station (Ctrl Stat)
4. Not supported by RPG II.
5. Requires no-charge RPQ.
6. 3275 only.
7. The 5100 is supported by CCP as a 2741.

**System Control and Service Programs:** These programs allow the user to prepare and service his disks, and to perform basic functions necessary for the operation of the system. They are:

**Library Maintenance Program:** Allows the user to produce and service the source and object program libraries. The principal functions of the program are as follows:

- Add (or delete) source programs, procedures and object programs to (or from) the user's program libraries.
- Allocate or re-allocate disk space to the libraries or to the system history area.
- Display library contents.
- Copy any or all of a library from one disk to another.
- Copy a module into a library from a disk file.
- Copy a module from a library to a disk file.
- Modify entries in the source library.

Libraries may reside on either a 5444 or in a 5444 simulation area on a 3340/3344. Control statements may be entered from the system input device: MFCU, MFCM, 1442, 2501, 3741 directly attached, or 3277 keyboard. Library entries may be "punched" on the system punch device: MFCU, MFCM, 1442, or 3741 directly

attached. Printed output may be on either the 1403 or 3284 Printer.

With 5704-SC2, the library entry retrieval subroutine (SUBR15) may be incorporated into a user-written RPG II or Assembler program in order to retrieve entries from any disk library (object, routine, source, procedure).

**Copy/Dump Program:** Used in the system generation process to provide the user with a system tailored for his installation. The program supports both file-to-file copies (COPY) and volume-to-volume copies (DUMP).

The file copy routines provide the user with an easy to use method of creating a file backup on another disk, tape, or printer. Additionally, it provides an easy method of moving files from one location to another, with both file limit modifications and reorganization. The program supports one input and one output per execution. Disk input can be a sequential, indexed, or direct file.

A sequential file can be copied to an indexed file, and tape, card and diskette files are supported for input and output. When copying a file, the printer may be specified in addition to other output. Records may be deleted from files by specifying a deletion code and position within each record. These deleted records may be printed. Using 5704-SC2, a direct file may be created from a sequential or direct file.

The volume copy allows the user to copy an entire volume to another volume for backup. The following combinations are supported:

- 5704-SC1: 5444 to 5444 ... 5445 to 5445 ... 3340 to 3340.
- 5704-SC2: 3340 to 3340 ... 3344 to 3344 ... 3340 to 3344 ... 3344 to 3340.

For the 3340 and 3344, either a main data area or simulation area can be copied. A simulation area can be copied only to another simulation area; a main data area can be copied only to another main data area.

**Dump/Restore Program:** Copies a disk volume to magnetic tape and restores a disk volume from a tape previously created by this program. For 5444 or 5444 simulation area, backup can be on diskettes.

Dump: 5444 to tape or diskettes ... 5445 to tape ... 3340/3344 main data area to tape ... 5444 simulation area to tape or diskettes.

Restore: 5444 on tape or diskettes to 5444 or 5444 simulation area ... 5445 on tape to 5445 ... 3340/3344 main data area on tape to 3340/3344 main data area ... 5444 simulation area on tape or diskettes to 5444 or 5444 simulation area.

**System/3 Model 15 SCP (cont'd)**

A tape created by this program can be used only by this program to restore the disk data at some future time, and cannot be accessed as a typical data file.

**Other Disk Programs:** The following programs are used for all disk units unless otherwise indicated.

**Disk Initialization Program** - Performs surface analysis on the user's disk and formats the disk according to disk system management requirements. (Not used for 5444 simulation areas.)

**Alternate Track Assignment** - Allows the user to assign an alternate track in place of a defective one and print the data content of the area in error.

**Alternate Track Rebuild** - Permits the user to correct data on the assigned alternate track.

**File and Volume Label Display** - Permits the user to display the entire Volume Table of Contents (VTOC) of a disk, or the information pertaining to a single file.

**File Delete** - is one means for deleting temporary data files from a disk and the only means for the user to delete permanent data files from a disk.

The following programs are used only for the disks indicated:

**System History Area Display (5445, 3340 or 3344)** - Permits the user to display or copy the contents of the system history area.

**1000-File VTOC Conversion (5445, 3340 or 3344)** - Permits the user to convert a 50-file VTOC on a 5445 to a 1000-file VTOC. For any disk with a 1000-file VTOC, this program can be used to compress the entries in the VTOC. For the 5704-SC2 user, only the compress function is supported.

**Simulation Area Program (3340 or 3344)** - This program is used to service the 5444 simulation areas on a 3340 or 3344. Copy, clear, rename, and display functions are provided.

**Reassign Alternate Track (3340)**—Permits the user to reassign the location of the alternate tracks on a data module so it can be used on a System/360 or System/370. The module is physically interchangeable, but the data is not.

**Recover Index (3340 or 3344)** - Permits the user to recover the index of an indexed file following abnormal program termination.

**File Compress (3340 or 3344)** - Permits the user to rearrange files to make one contiguous space out of the unused space between files. Using 5704-SC2, all of the files in a main data area may be copies to tape and be restored individually to disk.

**Spool File Copy Program (5704-SC2 only)** - Provides the user with access to the spool queues from a program partition—either a batch partition or a CCP partition. With this program, the user can: (1) copy the \$SPOOL file to disk or tape; (2) copy jobs into the reader queue from a file or terminal; (3) copy print steps to a file; (4) copy punch steps to a file; and (5) copy spool queue status displays to a file or terminal.

**5445 Data Interchange Utility (5445) (5704-SC1 only)** - This program is used prior to taking a 2316 Disk Pack from System/3 to System/360 or System/370 for processing, or prior to using the disk pack on System/3 after returning from System/360 or System/370. To use a 2316 Disk Pack in an interchange environment, it must have been initialized on System/3 and the interchange files must have been allocated on System/3. System/360 or System/370 OS or DOS may read, update, or in OS only, OUTPUT to these files, but may not create or extend them since OS and DOS do not create or update the System/3 Volume Table of Contents (VTOC).

**Other Tape Programs (3410/3411):**

**Tape Initialization Program** - Allows the users of magnetic tape to create and delete standard tape volume labels, check for unexpired files and to display existing volume and data file labels.

**Tape Error Summary Program** - Prints magnetic tape error statistics that have been accumulated during processing.

**Overlay Linkage Editor:** The Overlay Linkage Editor creates loadable programs from multiple relocatable modules. Output from the Overlay Linkage Editor may be cataloged in the object library and/or punched into cards or written on a diskette. Overlay structures may be created automatically or as designated by the user from relocatable program modules. The Overlay Linkage Editor is used by the RPG II, COBOL, and FORTRAN Compilers, by the Basic Assembler Program, by the CCP/Disk Sort Program and by the System Generation procedures.

**System Generation:** When a user installs a system, he performs a "System Generation" (SYSGEN) to create a supervisor and data management support for his particular configuration, and to include the program products he has ordered. During system generation, the source library, object library, and system history area are established. The characteristics of the required spooling support are also defined.

**Macros:** Macros provide data management and input/output support for the control of input/output services through assembler languages. The I/O services are available to users of assembler languages through the macro processor in conjunction with the disk system input/output service macros. The keyword macro statements coded by the user are expanded by the macro processor using the macro prototype definitions. The expanded code is in a form that can be processed by an assembler.

Macros provide system services, general I/O support, unit record device support, disk device support, tape device support, and CRT/Keyboard support.

**MRJE/WS:** System/3 model 15 MULTI-LEAVING Remote Job Entry Workstation (MRJE/WS) Program permits a model 15 equipped with a BSCA with EBCDIC (Text Transparency optional) to function as a MULTI-LEAVING Remote Job Entry Work Station communicating over a point-to-point (switched or nonswitched) line to a 370.

This program, included with the base SCP 5704-SC2 (model 15D), is functionally identical to the MRJE/WS feature for System/3 models 15A, 15B, and 15C (see 5704-SC1 feature #6001/#6002 in the SCP section). In addition, the 3344 Direct Access Storage is supported for input and output.

**Concurrent CE Diagnostics:** CE diagnostics for selected devices and functions are distributed with SCP and generated as a user system. These diagnostic functions can be executed under SCP control in one partition while another program (such as CCP) is being executed in another partition.

**SCP Main Storage Requirements:** (These figures are provided for planning purposes only and are subject to change.)

**Supervisor Requirements:** The base supervisor supports multiprogramming and certain I/O devices. The size of the resident supervisor support depends on the options selected during system generation:

	5704-SC1 (Rel. 6)	5704-SC2 (Rel. 2)
Base Supervisor	17.45K	21.07K*
Options:		
3340 Support	0.94	N/A
3410/3411 Support	1.16	1.16
3741 Support	0.50	0.50
3284 Support	0.50	0.50
5424 MFCU Support	N/A	0.65
2560 MFCM Support	N/A	0.69
1442 Support	N/A	0.25
2501 Support	N/A	0.21
I/O Storage Protection	0.49	0.49
Unit Record Restart	0.34	0.25**
Memory Resident Overlays	0.50	0.50
Second 1403 Printer	N/A	2.02
BSCA/DA/LCA/MLTA/SIOC	1.41	--
Add for SIOC	0.40	--
BSCA/DA/LCA/MLTA/BSCC		
96K to 256 CPU	--	1.17
384K or 512K CPU	--	1.27
Add for BSCA/DA/LCA	--	0.16
Add for MLTA	--	0.09
Add for SIOC	--	0.41
Add for BSCC	--	0.35
Interval Timer		
Either Time of day only	0.45	0.47
Or full timer support	2.00	2.00
Spooling		
Minimum	7.11	7.11
Maximum	17.21	20.79
CCP		
Minimum	1.69	1.91
Maximum	6.32	6.65

\* Includes 3340/3344 support.

\*\*includes extended restart as well as unit record restart.

The size of the supervisor is a multiple of 2K bytes.

The requirement for spooling depends on the devices and partitions selected for spooling. For example, with 7.11K spooling support, printer output from one partition can be spooled.

In addition to the resident supervisor requirements listed above, a resident file share common area is also required for SCP 5704-SC2. This area is a minimum of 2.00K and resides at the upper limit of main storage.

Depending on what modules are included during system generation, the size of the actual supervisor may not agree exactly with the size computed from the published tables.

Refer to *System Generation Reference Manual*, GC21-7616, for additional information regarding storage requirements.

**System/3 Model 15 SCP (cont'd)**

**System Control and Service Programs**

	Minimum Partition
Library Maintenance Program	10 K+
Copy/Dump Program	10 K+
Dump/Restore Program	8 K+
Disk Programs	
Disk Initialization	8 K+
Alternate Track Assignment	8 K+
Alternate Track Rebuild	8 K
File and Volume Label Display	
50-File VTOC	8 K
1000-File VTOC	10 K-18K
File Delete	8 K
System History Area Display	8 K
1000-File VTOC Conversion	8 K
3340 Simulation Area Program	10 K
Reassign Alternate Track	8 K
Recover Index	10 K
File Compress	10 K
Spool File Copy	10 K
5445 Data Interchange Utility	8 K
Tape Programs	
Tape Initialization	8 K
Tape Error Summary	8 K
Overlay Linkage Editor	10 K+
System Generation	30 K
Macro Processor	12 K+

+ These programs use additional storage, if available.

**SPECIFIED OPERATING ENVIRONMENT**

**HARDWARE REQUIREMENTS**

Minimum System Requirements: For an IBM System/3 model 15 with 5415 A Processing Unit:

- 5415 Processing Unit model A17 (48K bytes)
- 3277 Display Station model 1 with feature #4632 (Operator Console Keyboard)
- 5444 Disk Storage Drive
- 1403 Printer
- One of the following:
  - 5424 MFCU
  - 2560 MFCM
  - 1442 Card Read Punch

For a System/3 model 15 with 5415B or 5415C Processing Unit:

- 5415 Processing Unit model B17 (48K bytes) or model C21 (160K bytes)
- 3277 Display Station model 1 with #4632 (Operator Console Keyboard)
- 3340 Direct Access Storage Facility
- 1403 Printer
- One of the following:
  - 5424 MFCU
  - 2560 MFCM
  - 1442 Card Read Punch
  - 3741 Data Station, directly attached
  - 3741 Programmable Workstation, directly attached

For a System/3 model 15 with 5415D Processing Unit:

- 5415 Processing Unit model D19 (96K bytes)
- 3277 Display Station model 1 with #4632 (Operator Console Keyboard)
- 3340 Direct Access Storage Facility
- 1403 Printer
- One of the following:
  - 5424 MFCU
  - 2560 MFCM
  - 1442 Card Read Punch
  - 3741 Data Station, directly attached
  - 3741 Programmable Workstation, directly attached

The following devices are supported by SCP 5704-SC1 and its data management facilities:

- 5444 Disk Storage Drive models A2 and A3
- 5445 Disk Storage models 1, 2, and 3 (maximum 4)
- 3340 Direct Access Storage Facility models A2, B1 and B2 (3340 is mutually exclusive with 5444 and 5445)
- 3410/3411 Magnetic Tape Subsystem models 1, 2 and 3 (maximum 4 tape units)
- 1403 Printer models 2, 5 and N1
- 3277 Display Station model 1 (console)
- 5424 MFCU model A1 or A2
- 2560 MFCM model A1 or A2
- 1442 Card Read Punch model 6 or 7
- 2501 Card Reader model A1 or A2
- 3284 Printer model 1 (console)

- 1255 Magnetic Character Reader models 1, 2 and 3
- 1419 Magnetic Character Reader model 1
- 3881 Optical Mark Reader model 1
- 3741 Data Station models 1 and 2 (directly attached)
- 3741 Programmable Workstation models 3 and 4 (directly attached)

SCP 5704-SC2 and its data management facilities support the above devices with the following exceptions/additions:

- 5444 Disk Storage Drives are not supported.
- 5445 Disk Storage is not supported.
- 3344 Direct Access Storage model B2 is supported.

**SOFTWARE REQUIREMENTS (None)**

**DOCUMENTATION**  
(available from Mechanicsburg)

*Model 15 Introduction (GC21-5094) ... SCP Reference Manual (GC21-5077 for 5704-SC1) and (GC21-5162 for 5704-SC2) ... Operator's Guide (GC21-5075) ... Messages (GC21-5076) ... System Generation (GC21-7616) ... 3340 Reference Manual (GC21-5111) ... 3741 Reference Manual, GC21-5113 ... User's Guide to Spooling, GC21-7632 ... Disk Concepts and Planning (GC21-7571) ... System/3 Bibliography (GC20-8080).*

**SYSTEM/3 MODEL 15  
MULTI-LEAVING REMOTE JOB ENTRY  
WORKSTATION PROGRAM  
5704-SC1 FEATURE #6001-#6002**

**PURPOSE**

5704-SC1 feature #6001-#6002 is used with SCP 5704-SC1, and uses 5444, 5445 or 3340 disks.

Permits an IBM System/3 model 15 equipped with a Binary Synchronous Communications Adapter with EBCDIC (Text Transparency optional) to function as a MULTI-LEAVING Remote Job Entry Work Station communicating over a point-to-point (switched or non-switched) line to a System/370 operating under control of one of the following:

- HASP II (Version 3.1 or 4.0)
- ASP (Version 2.6 or 3.1)
- Remote Entry Services (RES) of JES under OS/VS1
- MULTI-LEAVING Work Station facilities of JES2/JES3 under OS/VS2
- VM/370 Remote Spooling Communications Subsystem (RSCS)

Any job which can be entered into the central system from locally-attached, similarly-functioned I/O devices can be entered from the System/3 model 15 workstation.

Workstation input may be read from any of the devices indicated below. Operator messages and output data sets may be directed to any of the devices shown below. Output may be returned to the submitting work station or routed to another work station or directed to local central system I/O devices.

	Input*	Messages	Output
5424 MFCU	X		X
2560 MFCM	X		X
1442 Card Read Punch**	X		X
2501 Card Reader	X		
3741 directly attached**	X		X
1403 Printer		X	X
3284 Printer		X	
5444 Disk Storage Drive	X		X
5445 Disk Storage	X		X
3340 Direct Access Storage Facility	X		X
3410/3411 Magnetic Tape	X		X
3277 Display Station	X	X	

\* Input may be from a combination of these devices.

\*\* Cannot be used for both input and output simultaneously.

All disk files created by the work station program are standard System/3 consecutive files and may be accessed by any of the following programs: MRJE/WS Print Utility, SCP Copy/Dump Program, or user-written RPG II, COBOL, FORTRAN or Assembler programs.

When using the Workstation program, the following restrictions apply:

- Column binary is not supported.
- Reading and punching of OS object decks requires the BSCA Text Transparency Feature and either a 2560 MFCM or 1442 Card Read Punch; OS object decks can be read from the 2501 Card Reader.
- For unit record devices (including the 3741), input record length can be 80 or 96 bytes; however, only the first 80 bytes of the input records will be processed by the workstation program.

**System/3 Model 15 SCP (cont'd)**

- Files processed with the READFILE command can contain records of other than 80 or 96 bytes. The file will be transmitted to the host central as 80-byte records. (Regrouping the data is the user's responsibility.)
- Print records which exceed the line length of the System/3 printer will be truncated.

**COMPATIBILITY**

The model 15 MRJE/WS Program is functionally compatible with the MRJE/WS programs for model 6, 8, 10 or 12. Differences exist only in MRJE/WS messages, MRJE/WS commands and the MRJE/WS program generation, which are designed to be easier to use on the model 15.

**SPECIFIED OPERATING ENVIRONMENT**

**HARDWARE REQUIREMENTS**

**Minimum System Requirements:** In addition to the minimum requirements for SCP, this feature requires a Binary Synchronous Communications Adapter (#2074) with EBCDIC. A minimum partition size of 16K bytes is required for execution.

**DOCUMENTATION**

(available from Mechanicsburg)

*Model 15 MRJE/WS Reference Manual (GC21-5115) ... System/3 Bibliography (GC20-8080).*

**SYSTEM/3 MODEL 15  
COMMUNICATIONS CONTROL PROGRAM  
5704-SC1, FEATURE #6033-#6070/#6071  
5704-SC2, FEATURE #6011/#6012**

**PURPOSE**

The Communications Control Program provides control program services needed for telecommunications systems.

5704-SC1 feature #6033 is resident on a 5444 Disk Storage Drive; 5704-SC1 feature 6070/6071 is resident on a 5444 simulation area on a 3340 Direct Access Storage Facility. Each feature requires the services of the supervisor and other SCP facilities of 5704-SC1.

5704-SC2 feature #6011/#6012 is resident on a 5444 simulation area on a 3340 Direct Access Storage Facility or 3344 Direct Access Storage, and it requires the services of the supervisor and other SCP facilities of 5704-SC2.

The services included in CCP are:

- High-Level language (COBOL, FORTRAN and RPG II) access to asynchronous start-stop (MLTA) and binary synchronous (BSCA, BSCC, DA, LCA) terminals.
- Program Fetch as a result of terminal operator requests.
- Resource Management to reduce contention between programs accessing the same files, provide access to terminals and manage storage available for application programs.
- Concurrent program execution allowing multiple application programs within the available storage.
- Terminal Monitoring to accept data and terminal commands.
- Display Format Facility (DFF) which permits the support of 3270 systems with a minimum of coding in high-level languages.

The Communications Control Program is designed to be an integral part of the SCP. CCP will control program execution in one partition of a multi-partition system. The minimum partition size is 16K bytes, exclusive of user program areas; there is no limit on the maximum size of the partition. One to 15 programs can run concurrently under CCP; each program can range in size from 4K to 32K bytes. By contrast, under CCP on the model 4, 8, 10, or 12, 1 to 8 programs can run concurrently, and each program can range in size up to 48K bytes. In the minimum system configuration, more than one program may be executed under control of CCP.

Using model 15A or 15B the minimum system required to support CCP with DFF and multiple tasks is 64K. With a 48K system, DFF cannot be used, and the user may be limited to a single task.

**CCP Device Support (System)**

	Generation	Execution
5444 Disk Storage Drive mdl A2 or A3	Yes	Yes
5445 Disk Storage mdl 1, 2 or 3 (5704-SC1 only)	Opt	Opt
3340 Direct Access Storage Facility mdl A2, B1 or B2	Yes	Yes
3344 Direct Access Storage mdl B2 (5704-SC2 only)	Yes	Yes
3410/3411 Magnetic Tape Subsystem mdl 1, 2 or 3	No	No
1403 Printer mdl 2, 5 or N1	Req	Opt
3277 Display Station mdl 1 (console)	Req	Req
5424 MFCU mdl A1 or A2	Opt	Opt
2560 MFCM mdl A1 or A2	Opt	Opt
1442 Card Read Punch mdl 6 or 7	Opt	Opt
2501 Card Reader mdl A1 or A2	Opt	Opt
3284 Printer mdl 1 (console)	Opt	No
1255 MCR mdl 1, 2 or 3	No	No
3881 OMR mdl 1	No	No
3741 Data Station mdl 1, 2, 3 or 4 (directly attached)	Opt	Opt

**Terminals and Features Supported:** Table 1 lists the devices supported by CCP on System/3 model 15. Table 2 lists the devices of the 3270 Information Display System that are supported by model 15 CCP. Both tables show the communications interface used to attach each device.

Listed below are the particular features supported by CCP for each terminal, system, or device.

**Asynchronous (start-stop) Terminals (via MLTA)**

- 1050 Data Communication System
  - Multipoint switched
  - Multipoint nonswitched
- 2740 Communication Terminal Model 1
  - Basic
  - Checking
  - Dial
  - Dial with checking
  - Dial with transmit control
  - Dial with transmit control and checking
  - Station Control
  - Station Control with checking
- 2740 Communication Terminal Model 2
  - Station Control
  - Station Control with checking
  - Station Control with Buffer Receive
  - Station Control with Buffer Receive and checking
- 2741 Communication Terminal
  - Basic
  - Switched
- 3767 Communication Terminal
  - Treated as a 2740 Communication Terminal (model 1 or 2) or as a 2741 Communication Terminal
- System/7
  - Supported as a 2740-1
  - Checking
  - Dial with checking
  - Station Control with Checking
- Communicating Magnetic Card Selectric® Typewriter
  - Point-to-point switched (appears identical to 2741)

**With Binary Synchronous Terminals**

- 3270 Information Display System
  - Multipoint nonswitched
  - Point-to-point switched (3275 only)
- 3735 Programmable Terminal
  - Switched
  - Multipoint
- 5110 Computer (as a data mode CPU)
  - Point-to-point (switched or nonswitched)
  - Multipoint tributary
- 5231 model 2 (supported as a 3741 model 2 or 4)
  - Point-to-point switched or nonswitched

SYSTEM CONTROL PROGRAMMING

System/3 Model 15 SCP (cont'd)

- 3741 Data Station model 2 and 3741 Programmable Workstation model 4
  - Point-to-point (switched and nonswitched)
  - Multipoint tributary
- 5280 Distributed Data System
  - Point-to-point (switched and nonswitched)
  - Multipoint tributary
- Series/1
  - Point-to-point (switched or nonswitched)
- System/3
  - Point-to-point nonswitched or switched
  - Multipoint control station
  - Multipoint tributary
- System/7
  - Point-to-point nonswitched or switched
  - Multipoint tributary
- System/32
  - Point-to-point nonswitched or switched
  - Multipoint tributary
- System/34
  - Point-to-Point nonswitched or switched
  - Multipoint tributary
- System/360 and System/370
  - Point-to-point nonswitched or switched
  - Multipoint with System/3 as tributary

In addition to controlling the terminals previously listed, the System/3 operates as a tributary terminal (BSCA only) to a host System/360 or System/370. In this configuration, the System/3 is a sub-host controlling terminals and is itself a terminal to another system.

Refer to the "Terminal Support Chart" in the System/3 model 15 CCP programming pages for more information.

Terminals equivalent to those listed may also work, but the user must establish the equivalency, and IBM assumes no responsibility for impact of changes made to programming support.

COMPATIBILITY

The System/3 model 15 Communications Control Program is upward compatible with the Communications Control Program for the model 4 (5703-SC1, feature #6033), for the model 8 and 10 (5702-SC1, feature #6033) or for the model 12 (5705-SC1, feature #6070). The interface between the system and the operator is different than that of the model 4, 8, 10 or 12.

SPECIFIED OPERATING ENVIRONMENT

HARDWARE REQUIREMENTS

**Minimum System Requirements:** In addition to the minimum system requirements of the SCP, the Communications Control Program requires one of the following: MLTA (RPQ S40028) or BSCA or BSCC or LCA or Display Adapter (#4601). In addition, at least one communications terminal of a type listed under "Terminals and Features Supported" must be included.

SOFTWARE REQUIREMENTS

Generation and execution of the model 15 Communications Control Program requires System/3 model 15 System Control Programming. If the MLTA is to be supported, the MLTA IOCS must be available.

No special programming system requirements exist for the running system assignments. For the preparation of application programs, an applicable compiler or assembler is required.

DOCUMENTATION  
(available from Mechanicsburg)

CCP System Reference Manual (GC21-7620) ... CCP Programmers Reference (GC21-7579) ... CCP System Operator's Guide (GC21-7619) ... CCP Terminal Operator's Guide (GC21-7580) ... CCP General Information (GC21-7578) ... CCP System Design Guide (GC21-5165) ... System/3 Bibliography (GC20-8080).

Table 1: Devices Supported by System/3 Model 15 CCP

	System/3-15 Communications Interface			
	Display Adapter	BSCA	BSCC (15D only)	MLTA
1050 Data Communication System				X
2740 Communication Terminal model 1				X
model 2				X
2741 Communication Terminal				X
3270 Information Display System (see Table 2)	X	X	X	X
3600 Finance Communication System		X	X	X
3735 Programmable Buffered Terminal		X	X	
3741 Data Station model 2		X	X	
3741 Programmable Workstation model 4		X	X	
3767 Communication Terminal				X
5100 Portable Computer				X
5230 Data Collection System (5231 Controller model 2)		X	X	
5280 Distributed Data System Communicating Magnetic Card		X	X	
Selectric Typewriter				X
System/3		X	X	
System/7		X	X	X
System/32		X	X	
System/34		X	X	
System/360		X		
System/370		X		

Notes:

- MLTA is mutually exclusive with BSCC.
- Display Adapter is mutually exclusive with BSCA-2.
- LCA is mutually exclusive with BSCA-1.

Table 2: 3270 Devices Supported by System/3 Model 15 CCP

	System/3-15 Communications Interface			
	Display Adapter	BSCA	BSCC (15D only)	LCA
				3270 Control Units
				3271 3274 3276
3271 Control Unit mdl 1		X	X	X
mdl 2		X	X	X
3274 mdl 1C Control Unit		X	X	X
3275 Display Station (nonsw) mdl 1		X	X	X
mdl 2		X	X	X
3275 Display Station (switched)		X		
3276-2 Control Unit		X	X	X
3277 Display Station mdl 1		X		X
mdl 2		X		X
3278-2 Display Station				X
3284 Printer mdl 1	X			X
mdl 2	X			X
3286 Printer mdl 1	X			X
mdl 2	X			X
3287 Printer mdl 1	X			X
mdl 2	X			X
3288 Line Printer mdl 2	X			X
3289 Printer mdl 1				X
mdl 2				X

SYSTEM CONTROL PROGRAMMING

**SYSTEM/3 MODEL 12  
SYSTEM CONTROL PROGRAMMING  
5705-SC1**

**PURPOSE**

The System/3 model 12 System Control Programming (SCP) consists of Disk System Management and System Utility Programs. These programs perform the system's control functions. They are supplied by IBM with the system at no additional charge.

**DESCRIPTION**

**Program Residence:** The SCP and libraries must reside on a 3340 Direct Access Storage Facility (DASF). These programs are stored in special areas on a 3340 data module called 5440 simulation areas. Each simulation area is large enough to contain data from one 5540 Disk Cartridge (2.45 million bytes). Two simulation areas on a data module mounted on 3340 Drive 1 can be used by system programming and are referred to as R1 and F1. Two simulation areas on a data module mounted on Drive 2 can be used by system programming and are referred to as R2 and F2. Use of these areas for program residence is the same as on an actual 5444 Disk Storage Drive.

System residence (pack from which Initial Program Load occurs and which contains the SCP library) must be on Drive 1 of a 3340 DASF. Libraries on the 3340 store object programs, source programs and Operation Control Language (OCL) procedures; the user libraries may reside on either Drive 1 or Drive 2 of a 3340 DASF. Data files reside in the main data area (40.8 million bytes per drive) of a 3340 data module.

**Disk System Management:** The Disk System Management consists of a supervisor, scheduler and data management facilities for operation and support of the system and for execution of user programs.

**HIGHLIGHTS**

- Automatic job-to-job transition.
- Selective retrieval of object programs, source programs, and procedures from libraries on disk.
- Execution of programs by using catalogued procedures - OCL procedures can be catalogued in the library and called by the scheduler at execution time.
- Support of ROLLOUT/ROLLIN capability - The ability to roll out a program during its execution, bring in an inquiry program to be executed and upon its completion, restart the original program. ROLLOUT/ROLLIN is supported by RPG II and FORTRAN, and is available to Assembler users; it is not supported for COBOL, Sorts, CCP, Utilities and System Control and Utility Programs. To use ROLLOUT/ROLLIN, a 5471 Printer-Keyboard is required. ROLLOUT/ROLLIN is supported in Program Level 1 only.
- Support of Checkpoint/Restart capability - The ability to write checkpoint records when using problem programs that have Checkpoint/Restart capabilities\* (such as COBOL). Restart provides the facility to resume the execution of programs from the last checkpoint rather than from the beginning, if processing is terminated for any reason (except controlled cancel) before the normal end of job. Checkpoint/Restart is supported in Program Level 1 only.
- \* The Tape Sort Program supports Checkpoint/Restart but uses its own routines rather than the system routines.
- Support of Dual Program Feature (DPF) - DPF allows two programs to reside in main storage at the same time. An expanded version of the supervisor controls program initiation, execution, and termination asynchronously in each of two main storage areas called program levels. Except for the 3340 DASF and the 5471 Printer-Keyboard, both program levels cannot use the same device at the same time. (Through the use of Print Spooling, the printer can serve both program levels.) Disk data files may be shared, but only one program level may write to a shared file. The 5471 Printer-Keyboard may be used by both program levels for either object program input/output of data, or operation control information. The Library Maintenance Program, the Macro Processor of the SCP (5705-SC1), the Basic Assembler (5705-AS1), and the Auto Report facility of RPG II (5705-RG1) will not run in the Dual Program mode but can run in a dedicated mode with the Dual Program Supervisor.
- Print Spooling - Print Spooling uses the 3340 DASF for intermediate storage of 5203 or 1403 Printer output. It allows a single printer to serve both program levels.

Print Spooling increases throughput by reducing the time the CPU waits for the completion of printer operations. With spooling, the printer output is performed at disk I/O speed. A job's printed output is stored in a disk area called a print queue, and printed at a later time.

Print Spooling requires as a prerequisite, either the 5471 Printer-Keyboard, or the Dual Program feature on the 5412 CPU.

**Data Management:** Data Management routines provide an interface between the user program and the required data file(s). Data Manage-

ment services are provided for disk, card, printer, diskette, printer-keyboard, and tape files.

**Disk Data Management:** For data files on the 3340 DASF, the following file organizations are supported: Sequential, Indexed or Direct. Processing of these files can be consecutive, sequential, or random. Split cylinder files are not supported.

Records may span physical disk boundaries (sectors, tracks, cylinders); the user need not be aware of the physical boundaries when writing programs to access the data. The fixed length records may be blocked or unblocked for processing, and the blocking factor may vary from program to program.

The main data area of a 3340 data module may contain a maximum of 1,000 files. A file may be large enough to require more than one disk pack. Multivolume sequential or indexed files may be online or offline. Multivolume direct files must be online. Offline multivolume files are allowed on Drive 2 only.

A simulation area may contain up to 50 files. Indexed and multivolume files are not supported in the simulation areas.

Standard System/3 Disk Labels are mandatory for all disk files. Data and labels are stored as 8-bit bytes on disk.

**Tape Data Management:** The 3410/3411 Magnetic Tape Subsystem is supported by data management. Magnetic tape is used as a data storage medium only; libraries and programs are not supported on tape, but they can be contained in data files on tape.

The following features are supported by the SCP tape data management routines:

- Fixed- or variable-length records
- Blocked or unblocked records
- Physical block size from 18 bytes to 32K bytes
- Multivolume files
- Unlabeled or labeled (ANSI or IBM Standard labels) tapes (non-standard labels on input will be bypassed)
- Recording format: EBCDIC or ASCII
- Tape Error Statistics

Tape support is functionally equivalent to model 10 tape support.

**Card I/O Data Management**

5424 MFCU - read 1-96 columns ... punch 1-96 columns ... print ... feed ... deferred punch or print ... stacker select ... single or double buffering ... combined file processing ... 64 EBCDIC characters for read, punch, or print ... same as model 10 support.

1442 - read 80 columns ... punch 1-80 columns ... read card image (column binary) ... feed ... stacker select ... single or double buffering ... combined file processing ... 256 EBCDIC characters for read or punch (except for card image model) ... same as model 10 support.

**Printer Data Management**

1403 - print 132-character line ... skip to line number before or after print ... space 0, 1, 2 or 3 before or after print ... page overflow detection ... Universal Character Set ... same as model 10 support.

5203 - print 96-, 120- or 132-character line ... skip to line number before or after print ... space 0, 1, 2 or 3 before or after print ... page overflow detection ... Universal Character Set ... Dual Feed Carriage ... same as model 10 support.

**Diskette Data Management**

3741 directly attached - read 1-128 characters ... write 1-128 characters ... single or double buffering ... 256 EBCDIC characters ... support similar to card I/O support ... for 3741 models 3 and 4, the Application Control Language (ACL), is not supported by data management.

**Printer-Keyboard Data Management**

5471 Printer-Keyboard - read 1-125 characters ... print 1-125 characters ... 64 EBCDIC character set (except minus zero) ... same as model 10 support.

**Communications Management:** Four communications interfaces are provided: RPG II Telecommunications (BSCA) support, BSCA Multiline/Multipoint (ML/MP) support, Multiple Line Terminal Adapter (MLTA) IOCS, and the Communications Control Program. The Terminal Support Chart shows the terminals supported by each interface. Refer to System/3 model 12 RPG II in the Program Product section for information on RPG II support. The MLTA IOCS is provided as a PSHRPO, (5799-WKH), and the Communications Control Program is an SCP feature (see 5705-SC1, feature #6070).

**BSCA Multiline/Multipoint Support:** Configurations supported are point-to-point nonswitched, point-to-point switched and multipoint leased line with the System/3 as a multi-dropped terminal or a control station. Also provided is the capability to operate two BSCA lines simultaneously on one System/3. The two BSCAs may have different



**System/3 Mdl 12 SCP (cont'd)**

configurations. For a list of BSC devices and of the communications modes in which each device is supported (e.g., point-to-point, multipoint, etc.), see page M5412. Support for the 3270 terminals via the Local Display Adapter is also included.

Program counters are maintained on disk to accumulate performance information per BSC line. Counters are logged at CLOSE time. A utility program allows the counters to be displayed.

RPG II Telecommunications Specifications must not be used in the same RPG II program to which subroutines using Multiline/Multipoint support are linked.

For compilation, ML/MP requires the SCP (5705-SC1), including the macros, and an assembler.

**3881 Data Management:** An SCP subroutine is supplied to perform device control and data management services for the 3881 Optical Mark Reader. The subroutine is used with a user-written RPG II or Assembler program and is functionally equivalent to the model 10 3881 feature.

**1255 and 1419 Data Management:** SCP subroutines are supplied to perform device control and data management services for the 1255 and 1419 Magnetic Character Readers.

The 1255 Subroutine (SUBR08) and the 1419 Subroutine (SUBR09) are used with a user-written RPG II or Assembler program and are functionally equivalent to the model 15 1255 (SUBR08) and 1419 (SUBR09) SCP support.

**Concurrent CE Diagnostics:** CE diagnostics for selected devices and functions are distributed with the SCP and generated as a user option. These diagnostic functions can be executed under SCP control in program level 1 while another program is being executed in program level 2.

SYSTEM CONTROL PROGRAMMING

System/3 Mdl 12 SCP (cont'd)

TERMINAL SUPPORT CHART FOR SYSTEM/3 MODEL 15

Terminals Operating with S/3-15	Type Comm (1)	Programming Support				Communication Code (2)					Communication Network (3)			
		RPGII	MLMP	MLTA	CCP	EBCDIC Nor	Tran	ASCII Nor	Tran	PTTC	Point-to-Point Sw	Point-to-Point Nonsw	Multi-Point Trib	Ctrl Stat
1050	SS	-	-	X	X	-	-	-	-	X	X	X	-	X
2740 mdl 1	SS	-	-	X	X	-	-	-	-	X	X	X	-	X
2740 mdl 2	SS	-	-	X	X	-	-	-	-	X	-	X	-	X
2741	SS	-	-	X	X	-	-	-	-	X	X	X	-	-
3767 (Note 7)	SS	-	-	X	X	-	-	-	-	X	X	X	-	X
5100/5110 (Note 8)	SS	-	-	X	X	-	-	-	-	X	X	X	-	-
CMCST	SS	-	-	X	X	-	-	-	-	X	X	-	-	-
S/7 ACC	SS	-	-	X	X	-	-	-	-	X	X	X	-	X
S/360 & 370	BSC	X	X	-	X	X	X	X	-	-	X	X	X	-
S/360 mdl 20	BSC	X	X	-	X	X	X	X	-	-	X	X	-	-
1130 (Note 5)	BSC	X	X	-	-	X	X	-	-	-	X	X	-	-
2780	BSC	X	X	-	-	X	X	X	-	-	X	X	-	-
2770	BSC	X	X	-	-	X	X	X	-	-	X	X	-	-
S/7	BSC	X	X	-	X	X	X	X	-	-	X	X	-	X(4)
2972 mdls 8,11	BSC	-	X	-	-	X	-	-	-	-	-	-	-	X
3735	BSC	-	X	-	X	X	-	X	-	-	X	-	-	X
S/3 mdls 4,6,8, 10,12,15	BSC	X	X	-	X	X	X	X	-	-	X	X	X	X(4)
3270	BSC	-	X	-	X	X	-	X	-	-	X(6)	-	-	X
3741 mdls 2, 4	BSC	X	X	-	X	X	X	-	-	-	X	X	-	X(4)
Series/1	BSC	X	X	-	X	X	X	X	-	-	X	X	-	-
S/32 & S/34	BSC	X	X	-	X	X	X	X	-	-	X	X	-	X(4)
5110	BSC	X	X	-	X	X	X	-	-	-	X	X	-	X(4)
5280 (as a 3741)	BSC	X	X	-	X	X	X	X	-	-	X	X	-	X(4)
5231 mdl 2 (as a 3741)	BSC	X	-	-	X	X	-	-	-	-	X	X	-	X(4)
6670 (as a 2770)	BSC	X	X	-	-	X	X	X	-	-	X	X	-	-

Legend:

X = Supported  
 - = Not Supported

Notes:

- Type Comm - Type of Communication  
 SS = Start/Stop  
 BSC = Binary Synchronous Communication
- Communication Code (as supported by System/3-12)  
 Nor = Normal  
 Tran = Transparency  
 PTTC = Paper Tape Transmission Code
- Communication Network  
 Point-to-Point Switched (Sw)  
 Point-to-Point Nonswitched (Nonsw)  
 Multipoint, System/3 as a tributary station (Trib)  
 Multipoint, System/3 as a control station (Ctrl Stat)
- Not supported by RPG II
- Requires no-charge RPL.
- Only the 3275 (supported by ML/MP)
- The 3767 is supported as a 2740 model 1 or 2 or a 2741 by CCP.
- The 5100 is supported as a 2741 by CCP.

System Control and Utility Programs:

These programs allow the user to prepare and maintain modules, and to perform basic functions necessary for the operation of the system. They are:

**Library Maintenance Program:** Allows the user to produce, maintain, and service the source and object program libraries. The principal functions of the program are as follows:

- Add (or delete) source programs, procedures and object programs to (or from) the user's program libraries.
- Allocate or re-allocate disk space to the libraries.
- Print or punch library contents.
- Copy a part or all of a library from one simulation area to another.
- Copy a module into a library from a diskette (3741 directly attached), card, or disk file (either on the simulation area or main data area).
- Modify entries in the source library.
- Copy a module from a library to a disk file located on the simulation area or main data area.

The Library Maintenance program requires a dedicated system.

**Copy/Dump Program:** This program supports both file-to-file copies (COPY) and volume-to-volume copies (DUMP).

The 'file copy' routines provide the user with an easy-to-use method of creating a file backup on another disk, diskette, cards, tape, or printer.

Additionally, it provides an easy method of moving files from one location to another, with both file limit modifications and reorganization. The program supports one input and one output per execution. Disk input can be a sequential, indexed, or direct file. A sequential file can be copied to an indexed file, and tape, card and diskette files are supported for input and output. When copying a file, the printer may be specified in addition to tape, card, diskette, or disk output. Records may be deleted from files by specifying a deletion code and position within each record. These deleted records may be printed.

The volume copy function of the Copy/Dump Program copies the main data area from one data module to another (the Simulation Area Program copies the simulation areas).

**Simulation Area Program:** This program is used to service the simulation areas of a 3340 data module. Copy, clear, move, rename, and display functions are provided.

**Dump/Restore Program:** Copies an entire main data area (D1, D2) to magnetic tape and restores a main data area from a tape previously created by this program. Copies an entire simulation area (R1, F1, R2, F2) to magnetic tape or diskettes and restores a simulation area from tape or diskettes previously created by this program.

A tape or diskettes created by this program can be used only by this program to restore the disk data at some future time, and can't be accessed as a typical data file.

**Spool Writer Program:** This program controls the printing of the spooled output and handles Operator Control Command (OCC) requests. The program operates in a program level (or on a dedicated system) and is executed like any other program. The Spool Writer requires, as a prerequisite, either the 5471 Printer-Keyboards, or the Dual Program Feature on the 5412 CPU.

Execution of the program is controlled by the operator, using OCC commands. On a dedicated system (without the Dual Program Feature), commands are entered via the 5471 Printer-Keyboards. On a DPF system, commands are entered via the system input device or the 5471 Printer-Keyboards (optional on a DPF system).

Other Disk Utilities (3340)

**Disk Initialization Program -** Formats the data module according to disk system management requirements.

**Alternate Track Assignment Program -** Allows the user to assign an alternate track in place of a defective one and print the data content of the area in error.

**Alternate Track Rebuild Program -** Permits the user to correct data on the assigned alternate track.

**File and Volume Label Display Program -** Permits the user to display the entire Volume Table of Contents (VTOC) of either a simulation

**System/3 Mdl 12 SCP (cont'd)**

area or main data area or the VTOC information pertaining to a single file.

**File Delete Program** - Is one means for deleting temporary data files from a simulation area or main data area and the only means for the user to delete permanent data files from either a simulation area or main data area.

**Re-assign Alternate Track Program** - Permits the user to re-assign the location of the alternate tracks on a data module so it can be used on a System/360 or System/370. The module is physically interchangeable, but the data is not.

**Recovery Index Program** - Permits the user to recover the index of an indexed file following abnormal program termination.

**Tape Utilities (3410/3411)**

**Tape Initialization Program** - Allows the users of magnetic tape to create and delete standard tape volume labels, check for unexpired files and to display existing volume and data file labels.

**Tape Error Summary Program** - Prints magnetic tape error statistics that have been accumulated during processing.

**Overlay Linkage Editor:** The Overlay Linkage Editor creates loadable programs from multiple relocatable modules. Output from the Overlay Linkage Editor may be cataloged in the object library and/or punched into cards or written on a diskette. Overlay structures may be created automatically or as designated by the user from relocatable program modules. The Overlay Linkage Editor is used by the COBOL and FORTRAN Compilers, by the Basic Assembler Program, and by the System Generation procedures. (RPG II uses its own Linkage Editor.)

**System Generation:** When a user installs a system, System Generation (SYSGEN) is performed to create a supervisor and data management support for the particular configuration, and to include the program products the user has ordered. During system generation, the source library and object library are established. The characteristics of the required spooling support are also defined.

**Macros:** Macros provide data management and input/output support for the control of input/output services through an assembler language. The I/O services are available to users of an assembler language through the macro processor in conjunction with the disk system input/output service macros. The keyword macro statements coded by the user are expanded by the macro process or using the macro prototype definitions. The expanded code is in a form that can be processed by an assembler.

Macros provide system services, general I/O support, unit record device support, disk device support, tape device support, and communications support.

**SCP Main Storage Requirements**

**Supervisor Requirements:** The minimum main storage requirement for the supervisor on the model B16 (32K), B17 (48K), and B18 (64K), is 7.2K bytes. For the C19 (80K) and C20 (96K), the minimum main storage requirement is 8.8K bytes. The minimum supervisor on both the B-models and the C-models supports the following configuration:

- 3340 DASF model C2
- 5203 or 1403 Printer
- 5424 MFCU or 1442 Card Read Punch

For the Dual Program Feature, on the B-models, add 0.9K bytes; on the C-models, the minimum supervisor supports the Dual Program feature.

For print spooling support on the B-models, add 4.8K bytes for one program level, or 6.1K bytes for two program levels; on the C-models, add 5.1K bytes for one program level, or 6.4K bytes for two program levels.

Additional supervisor main storage is required, on any model, to support:

BSCA-2 or ICA or LDA and/or MLMP:	0.3K bytes
3410/3411 Magnetic Tape Subsystem:	0.7K bytes
5471 Printer-Keyboard:	0.3K bytes
3741 Data/Programmable Workstation, directly attached:	0.6K bytes

Additional supervisor main storage is required, on C-models using CCP, for a CCP intercept routine: 0.5K bytes.

When calculating the main storage requirements for program level 1 on any model or for program level 2 on B-models, the supervisor size (including optional print spooling) must be rounded up to the nearest multiple of 0.25K bytes.

When calculating the main storage requirements for program level 2 on the C-models, the supervisor size (excluding any spooling support) must be rounded up to the nearest multiple of 2.0K bytes.

**System Control and Utility Programs**

	Minimum Program Level
Library Maintenance Program	8K*
Copy/Dump Program	8K*
Simulation Area Program	8K*
Dump/Restore Program	8K
Spool Writer Program	8K
Disk Programs	
Disk Initialization	8K
Alternate Track Assignment	8K
Alternate Track Rebuild	8K
File and Volume Label Display	8K**
File Delete	8K
Recover Index	10K*
Reassign Alternate Track	8K
File Compress	10K*
Recover Index	10K
Tape Programs	
Tape Initialization	8K
Tape Error Summary	8K
Overlay Linkage Editor	8K
Macro Processor	12K*

\* These programs use additional storage, if available.

\*\* 8K for simulation areas; 10-18K for main data areas. Total memory required is a function of the number of files and the use of the SORT function.

**SPECIFIED OPERATING ENVIRONMENT**

**HARDWARE REQUIREMENTS**

**Minimum System Requirements:** As a minimum, the System Control and Utility Programs require a configuration of the IBM System/3 model 12 which includes an IBM 5412 Processing Unit model B16 (32K) ... an IBM 3340 DASF ... an IBM 5203 or 1403 Printer ... and an IBM 5424 MFCU or an IBM 1442 Card Read Punch or a directly-attached IBM 3741 Data Station/Programmable Workstation. Additionally, a C19 or C20 Processing Unit requires the Dual Program feature (#3500) for IBM Programming Systems Support.

SCP services are also provided for the IBM 3410/3411 Magnetic Tape Subsystem ... the IBM 5471 Printer-Keyboard ... and the IBM 3881 Optical Mark Reader model 1... the IBM 1255 Magnetic Character Reader model 1, 2 and 3... and the IBM 1419 Magnetic Character Reader model 1 (requires an RPQ on the 1419).

**SOFTWARE REQUIREMENTS (None)**

**DOCUMENTATION**  
(available from Mechanicsburg)

*System/3 Model 12 Introduction (GC21-5116) ... System/3 Model 12 System Control Programming Reference Manual (GC21-5130) ... System/3 Model 12 User's Guide (GC21-5142) ... System/3 Multiline/Multipoint BSC Reference Manual (GC21-7573) ... 3881 Optical Mark Reader Model 1 Program Reference and Logic Manual (GC21-5103) ... Tape Program Planning Manual (GC21-5040) ... System/3 Models 12 and 15 1255 and 1419 Magnetic Character Readers Reference and Program Logic Manual (GC21-5132) ... System/3 Bibliography (GC20-8080).*

**MULTI-LEAVING REMOTE JOB ENTRY WORKSTATION PROGRAM**

**Feature #6001**

**PURPOSE**

Permits a System/3 Disk System equipped with an Integrated Communications Adapter (remote only) or a Binary Synchronous Communications Adapter with EBCDIC (Text Transparency optional) to function as a MULTI-LEAVING Remote Job Entry Work Station communicating over a point-to-point (switched or non-switched) line to a S/360 or S/370. MRJE/WS operates with one of the following:

- HASP II (Version 3.1 or 4.0)
- ASP (Version 2.6 or 3.1)
- Remote Entry Services (RES) of JES under OS/VS1
- MULTI-LEAVING Workstation facilities of JES2/JES3 under OS/VS2
- Remote spooling capability of VM/370 (RSCS)

**DESCRIPTION**

Any job which can be entered into the central system from locally attached, similarly-functioned I/O devices can be entered from the System/3 MRJE Workstation. Workstation input may be read from the 5424 MFCU, the 1442 Card Read Punch, the directly-attached 3741 Data Station/Programmable Workstation, the 3340 Direct Access Storage Facility, the 5471 Printer-Keyboard, the 3410/3411 Magnetic Tape Subsystem or from a combination of these devices. Operator

### System/3 Mdl 12 SCP (cont'd)

messages may be directed to either the System/3 printer or the 5471 Printer-Keyboard.

Output data sets may be directed to the System/3 printer (5203 or 1403 both of which can be spooled), the 5424 MFCU, the 1442 Card Read Punch, the directly attached 3741 Data Station/Programmable Workstation, or written to disk or magnetic tape. Output may be returned to the submitting work station or routed to another workstation or directed to local central system I/O devices.

All files created by the MRJE/WS program are standard System/3 consecutive files and may be accessed by user-written RPG II, COBOL, FORTRAN and Assembler Programs, or by the Copy/Dump program. Also, the MRJE/WS Print Utility can be used to print data which was directed to disk or tape data sets during an MRJE/WS session.

When using the MRJE/WS Program, the following restrictions apply:

- Column binary is not supported.
- Reading or punching of OS object decks requires the BSCA Text Transparency feature and a 1442 Card Read Punch.
- Input record lengths may be greater than 96 bytes; however, the input file will be transmitted to the host central as 80-byte records, and it will be the users' responsibility to regroup the data.
- Print records which exceed the print positions of the System/3 printer will be truncated.
- The Workstation Program requires a logging device.

The 5471 Printer-Keyboard is required only if the MRJE/WS is an Inquiry program, or if the MRJE/WS output is being spooled.

#### SPECIFIED OPERATING ENVIRONMENT

##### HARDWARE REQUIREMENTS

**Minimum System Requirements:** In addition to the minimum requirements of 5705-SC1, this feature requires a Binary Synchronous Communications Adapter (#2074 or #2084) with EBCDIC or the Integrated Communications Adapter (#4645 and #6202). A minimum program level size of 14K bytes is required for execution.

##### SOFTWARE REQUIREMENTS (5705-SC1)

##### COMPATIBILITY

The model 12 MRJE/WS program is functionally compatible with the MRJE/WS programs for System/3 model 6, 8 or 10.

##### DOCUMENTATION

(available from Mechanicsburg)

*System/3 MRJE/WS Reference Manual (GC21-7621) ... System/3 Bibliography (GC20-8080).*

### SYSTEM/3 MODEL 12 COMMUNICATIONS CONTROL PROGRAM Feature #6070

#### PURPOSE

The Communication Control Program (CCP) provides control program services needed for telecommunications systems. This SCP feature is resident on a 3340 Direct Access Storage Facility and requires the services of the Supervisor and other SCP facilities (5705-SC1).

The services included are:

- High-Level language (COBOL, FORTRAN, and RPG II) access to MLTA, BSCA (including the Integrated Communications Adapter), and Local Display Adapter attached terminals.
- Program Fetch as a result of terminal operator requests.
- Resource Management to reduce contention between programs accessing the same files, provide access to terminals and manage storage available for application programs.
- Concurrent program execution allowing multiple application programs within the available storage.
- Terminal Monitoring to accept data and terminal commands.
- Display Format Facility (DFF) which permits the support of 3270 systems with a minimum of coding in high-level languages.

The Communications Control Program is designed to be an integral part of the SCP. CCP will control program execution in one program level on a system with the Dual Program feature. The minimum main memory requirements for CCP (exclusive of Supervisor requirements) are: 18K, plus 4K for DFF, plus a user program (5K minimum). One to eight programs can run concurrently.

**Terminals and Features Supported:** The following terminals may be used with the Communications Control Program:

Through the Multiple Line Terminal Adapter (MLTA):

- 1050 Data Communication System
  - Multipoint switched
  - Multipoint nonswitched
- 2740 Communication Terminal model 1
  - Basic
  - Checking
  - Dial
  - Dial with checking
  - Dial with transmit control
  - Dial with transmit control and checking
  - Station Control
  - Station Control with checking
- 2740 Communication Terminal model 2
  - Station Control
  - Station Control with checking
  - Station Control with buffer receive
  - Station Control with buffer receive and checking
- 2741 Communication Terminal
  - Basic
  - Switched
- 3767 Terminal
  - Supported by CCP as a 2740 model 1 or 2 or a 2741.
  - Transparent to MLTA.
- Communicating Magnetic Card Selectric® Typewriter (appears identical to 2741)
  - Point-to-point switched
- System/7 (appears identical to a 2740 model 1)
  - Checking
  - Dial with checking
  - Station control with checking

With the Binary Synchronous Communications Adapter (BSCA), or the Integrated Communications Adapter (ICA):

- 3270 Information Display System
  - Point-to-Point nonswitched
  - Multipoint nonswitched
  - Switched - 3275 only
- 3735 Programmable Terminal
  - Switched
  - Multipoint
- 5231 model 2 (appears identical to a 3741-2, 4)
  - Point-to-point switched or nonswitched
- 3741 Data Station model 2 and 3741 Programmable Workstation Station model 4
  - Point-to-Point (switched and nonswitched)
  - Multipoint tributary
- 5110 Computer (as a data mode CPU)
  - Point-to-point (switched and nonswitched)
  - Multipoint tributary
- 5280 Distributed Data System
  - Switched
  - Nonswitched point-to-point
  - Multipoint tributary
- Series/1
  - Switched
  - Nonswitched point-to-point
- System/3
  - Switched
  - Nonswitched point-to-point
  - Multipoint control station
  - Multipoint tributary
- System/7
  - Switched
  - Nonswitched Point-to-point
  - Multipoint (System/3 is control station)
- System/32
  - Switched
  - Nonswitched point-to-point
  - Multipoint (System/3 is control station)
- System/34
  - Switched
  - Nonswitched point-to-point
  - Multipoint (System/3 is control station)

SYSTEM CONTROL PROGRAMMING

System/3 Mdl 12 SCP (cont'd)

- System/360 and System/370
  - Switched
  - Nonswitched point-to-point
  - Multipoint (System/3 is tributary)

With the Local Display Adapter:

- 3277 Display Station
- 3284 Printer, model 1 or 2
- 3286 Printer, model 1 or 2
- 3288 Printer, model 2

In addition to controlling the terminals previously listed, the System/3 operates as a multipoint tributary (BSCA only) to a host S/360 or S/370. In this configuration, the System/3 is a sub-host controlling terminals and is itself a terminal to another system.

Refer to the "Terminal Support Chart" in the model 12 SCP section for more information.

Terminals equivalent to those listed may also work, but the user must establish the equivalency, and IBM assumes no responsibility for impact of changes made to programming support.

COMPATIBILITY

The System/3 model 12 Communications Control Program is upward compatible with the Communications Control Program for the System/3 model 4 (feature #6033) and for the System/3 model 8 and 10 (5702-SC1, feature #6033). The interface between the system and the operator is different than that of the model 4, 8, or 10.

SPECIFIED OPERATING ENVIRONMENT

HARDWARE REQUIREMENTS

Minimum System Requirements: CCP requires an IBM System/3 model 12 which includes as a minimum, an IBM 5412 Processing Unit model B17 (48K bytes) ... an IBM 3340 DASD ... an IBM 5203 or 1403 Printer ... an IBM 5424 MFCU or an IBM 1442 Card Read Punch or a directly-attached IBM 3741 Data Station/Programmable Workstation ... an IBM 5471 Printer-Keyboard ... a Binary Synchronous Communications Adapter or the Multiple Line Terminal Adapter (MLTA) RPQ (RPQs S40028 through S40033) or the Integrated Communications Adapter (#4645) or the Local Display Adapter (#4702) ... and at least one communications terminal of a type listed under "Terminals and Features Supported". Additionally, if CCP is to run on a C-model CPU, that model requires the Dual Program feature (#3500) for IBM Programming Systems Support.

CCP will operate with the Dual Program feature (DPF), however, CCP does not require the DPF to allow more than one program to be executed at a time. Use of the DPF is not prohibited during execution of the CCP, but any program executed in the other program level does not run under control of the CCP. CCP cannot be run in both program levels concurrently.

CCP Device Support (System)

	Generation	Execution
3340 Direct Access Storage Facility model C2	Req	Req
3410/3411 Magnetic Tape Unit model 1, 2 or 3	No	No
5203 Printer, model 1, 2 or 3	Req*	Opt
1403 Printer, model 2, 5 or N1	Req*	Opt
5424 MFCU, model A1 or A2	Opt	Opt
1442 Card Read Punch, model 6 or 7	Opt	Opt
5471 Printer-Keyboard, model 1	Opt	Req
3741 Data Station/Programmable Workstation model 1, 2, 3 or 4 (directly attached)	Opt	Opt
1255 MCR model 1, 2 or 3	No	No
3881 OMR model 1	No	No

\* Either a 5203 or 1403 Printer is required during CCP generation.

SOFTWARE REQUIREMENTS

Generation and execution of the model 12 Communications Control Program requires IBM System/3 model 12 System Control Programming (5705-SC1). If the MLTA is to be supported, the MLTA IOCS (5799-WKH) must also be available.

No special programming system requirements exist for the running of system assignments. For the preparation of application programs, an applicable compiler or assembler is required.

Note: While MLTA can run in either program level on the B-model CPU, it can run in only program level one on the C-models.

DOCUMENTATION

(available from Mechanicsburg)

*System/3 CCP General Information Manual (GC21-7578) ... System/3 CCP Program Reference Manual (GC21-7579) ... System/3 CCP Terminal Operator's Guide (GC21-7580) ... System/3 Models 10 and 12 CCP System Operator's Guide (GC21-7581) ... System/3 Models 10 and 12 CCP System Reference Manual (GC21-7588) ... System/3 Bibliography (GC20-8080).*