

Introduction to DOS Logic

Program Number 360N-CL-453

This reference publication gives an overall view of the Disk Operating System (DOS), and it briefly describes the associated control and service programs.

It is intended for persons who are involved in program maintenance and for system programmers who are altering the program design. Program logic information is not needed for normal use or operation of the system control program.

This manual is designed to introduce and to cross-reference the six companion PLMs of the Disk Operating System. These associated PLMs are listed in the Preface of this manual.

For titles and abstracts of other associated publications, see the IBM System/360 and System/370 Bibliography, GA22-6822.

Thirteenth Edition (October 1971)

This publication was formerly titled IBM System/360 Disk Operating System: Introduction to System Control Programs. Although titles of some DOS publications (including this one) have been simplified, the change does not affect the contents of the publications.

This edition applies to Release 26 of the IBM Disk Operating System and to all subsequent releases until otherwise indicated in new editions or Technical Newsletters. Changes are continually made to the specifications herein; before using this publication in connection with the operation of IBM systems, consult the latest System/360 and System/370 SRL Newsletter, GN20-0360, for the editions that are applicable and current.

This edition is a major revision of, and obsoletes, GY24-5017-11.

Summary of Amendments

This edition provides documentation changes for:

- Enhancements to OLTEP
- Enhancements to PDAID
- New problem determination commands ALTER, DSPLY, and DUMP
- Maintenance and technical corrections

Changes or additions to the text and illustrations are indicated by a vertical line to the left of the change.

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This Program Logic Manual (PLM) is a general guide to the IBM Disk Operating System system control programs. It is to be used with these six other PLMs:

- DOS IPL and Job Control, GY24-5086
- DOS Supervisor and Related Transients, GY24-5151
- DOS Librarian, GY24-5079
- DOS Linkage Editor, GY24-5080
- DOS Logical Transients, GY24-5152
- DOS System Service Programs, GY24-5153

Note: Although titles of some DOS publications have been simplified, the change does not affect the contents of the publications.

Publications that will aid in the understanding of these seven manuals are:

- IBM System/360 Principles of Operation, GA22-6821
- IBM System 360 Disk and Tape Operating Systems, Assembler Language, GC24-3414
- DOS System Control and Service, GC24-5036

Publications that are related to the subject of the seven manuals are:

- DOS Supervisor and I/O Macros, GC24-5037
- DOS System Generation, GC24-5033
- DOS Operating Guide, GC24-5022
- DOS Messages, GC24-5074

- DOS Data Management Concepts, GC24-3427
- DOS LIOCS Volume I: Introduction, GY24-5020
- IBM System/360 Disk Operating System, Basic Telecommunications Access Method PLM, GY30-5001
- IBM System/360 Disk Operating System, Queued Telecommunications Access Method PLM, GY30-5002

Titles and abstracts of other related publications are listed in the IBM System/360 and System/370 Bibliography, GA22-6822.

This manual consists of eight major sections:

1. General description of the DOS system control programs
2. Description of system files on disk
3. Organization of the system residence (SYSRES) and private libraries
4. Description of the control programs
5. Description of the linkage editor
6. Description of the librarian
7. Procedures to follow as error recovery aids (Problem Determination)
8. Appendixes containing error messages, microfiche cross-reference master index, a master index to the seven PLMs that describe the program logic of DOS system control, and a brief description of the Volume Table of Contents (VTOC).

This edition includes a glossary.



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The IBM Disk Operating System (DOS) system control programs provide disk operating system capabilities for 16K and larger configurations. At least one IBM 2311 Disk Storage Drive, one IBM 2314 Direct Access Storage Facility, or one IBM 2319 Disk Storage Facility is required.

Systems larger than 16K can benefit from this 16K package if they do not require the expanded functions of the larger disk operating system packages offered by IBM. The system is disk resident, using the IBM 2311, 2314, or 2319 for on-line storage of all programs. Depending on the requirements of the particular application, the system can be expanded to include all processing programs used to perform the various jobs of a particular installation, or it can be tailored to a minimum system to control a single program.

The operating system is composed of many components which include: CPU, input/output channels, input/output control units, input/output devices, microprogramming, system control programs, support programs, user programs, user data files, teleprocessing capability, and multiple programming capability. Only the system control programs are within the scope of this publication. Of the system control programs, the supervisor and physical IOCS are specifically designed for a user's configuration by means of a one-time assembly (generation time). They require re-assembly only if the user's configuration changes.

The supervisor and physical IOCS provide the required interface between the program being executed and the other components of the operating system. The program currently being executed is identified to the operating system as the current program (definition used with this manual). The last program interrupted is identified as the problem program. The problem program or the current program can, at any given time, be a system control program, a support program, or a user program.

MULTIPROGRAMMING

For those systems with main storage equal to or in excess of 24K, Disk Operating System offers multiprogramming support. This support is referred to as fixed partitioned multiprogramming, because the

number and size of the partitions are fixed, or defined, during system generation. The size of the partitions may be redefined by the console operator after system generation, to meet the needs of a specific program to be executed.

Multiprogramming has two types of problem programs: foreground and background. Foreground programs may operate in either the batched-job mode or the single-program mode. Background programs and batched-job foreground programs are initiated by Job Control from the batched-job input streams.

The operator initiates single-program foreground programs from the IBM 1052 Printer-Keyboard for System/360, or from the IBM 3210 Console Printer-Keyboard for System/370. The IBM 3215 Console Printer-Keyboard can be used instead of the IBM 3210. When one program is finished executing, the operator must explicitly initiate the next program.

Note: (B) corresponds to alter code 5 on the IBM 1052 Printer-Keyboard, and to the END key on the IBM 3210 or 3215 Console Printer-Keyboard.

Background and foreground programs initiate and terminate completely independent of each other.

The system is capable of concurrently operating one background program and one or two foreground programs. Priority for CPU processing is controlled by the supervisor, with foreground programs having priority over background programs. 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 which is in a ready state.

Control is taken away from a high priority program when that program encounters a condition that prevents continuation of processing until a specified event has occurred. Control is taken away from a lower priority program at the completion of an event for which a higher priority program was waiting. When all programs in the system are simultaneously waiting (that is, no program can process), the system is placed in the wait state enabled for interrupts.

Interrupts are received and processed by the supervisor. When an interrupt

satisfies a wait condition of a program, that program becomes active and competes with other programs for CPU processing time.

In addition to at least 24K positions of main storage, multiprogramming support requires the storage-protection feature.

If the batched-job foreground option is selected when the system is generated, all types of programs may be run as foreground programs. (Specifying the option causes the generation of individual communication regions for each partition.) However, the Copy function of the librarian is restricted to the background partition.

ASYNCHRONOUS PROCESSING

The asynchronous processing function, also known as multitasking, provides a multiprogramming facility within any or all of the partitions of an MPS supervisor. An asynchronous program to be run within a partition consists of two parts:

1. The main program (main task) that appears in the EXEC statement.
2. One or more subprograms (subtasks) that must be in main storage in the same partition as the main task.

The main task initiates execution of the subtask(s) via the ATTACH macro instruction. I/O overlap is facilitated because subtasks have higher priority than the main task for CPU time within the partition. The subtasks are assigned priority in the order they are attached. The first attached subtask has the highest priority and the last attached subtask has the lowest priority. The priorities of the partitions are unchanged.

Each subtask operates independently of the main task and has its own registers and save area. Communication and synchronization between subtasks is accomplished by use of the POST and WAIT/WAITM macro instructions. Protection of shared data areas (resources) is accomplished by the ENQ macro and the corresponding DEQ macro.

Because only one set of symbolic I/O units exists for each partition, I/O assignments for all tasks must be made before the EXEC statement of the main task.

TELECOMMUNICATIONS

Disk Operating System includes telecommunications capability. Two access methods are available: Basic Telecommunications Access Method (BTAM) and Queued Telecommunications Access Method (QTAM). BTAM requires at least 24K positions of main storage, but QTAM requires a minimum main storage capacity of 32K.

A BTAM program can be run as either a foreground or a background program. Normally, it is run as a foreground-one program and thus has the highest priority of any program being executed at a particular time.

In a system operating under QTAM, the QTAM message control program must be run in the foreground-one partition. As many as two QTAM message processing programs may be run in either foreground or background partitions.

CONFIGURATION

This section presents the minimum configuration requirements, as well as the additional features and devices supported by the DOS system control. Presentation is in the following order:

1. Minimum requirements
2. Additional features
3. I/O devices
4. System I/O devices and system I/O flow

MINIMUM REQUIREMENTS

The minimum configuration required by the DOS system control is:

1. 16K bytes of main storage (see Additional Features section for minimum main storage requirements when certain options are specified).
2. Standard instruction set (language translators can require extended instruction sets).
3. One I/O channel, either multiplexor or selector. See Note 1.
4. One card reader (1442, 2501, 2520, or 2540). See Note 3.

5. One card punch (1442, 2520, or 2540). See Note 2.
6. One printer (1403, 1404, 1443, or 3211). See Note 2.
7. One IBM 1052 Printer-Keyboard for System/360 or one IBM 3210 Console Printer-Keyboard for System/370. You can use the IBM 3215 Console Printer-Keyboard instead of the IBM 3210.
8. One IBM 2311 Disk Storage Drive, one IBM 2314 Direct Access Storage Facility, or one IBM 2319 Disk Storage Facility.

Note 1: Telecommunications requires a multiplexor channel and at least one selector channel.

Optical reader/sorter and magnetic ink character reader (MICR) processing require at least two I/O channels. If MICR devices are attached to the multiplexor channel, no burst mode devices will be supported on the multiplexor channel. MICRs should be attached as the highest priority devices on the multiplexor channel. Single addressing 1270 or 1275 (these devices are not available in the United States of America), 1412s or 1419s, 1255 or 1259 is supported on any selector channel, but device performance is maintained only if a selector channel is dedicated to a single MICR device. Also note that the dual address 1275/1419 is not attachable to selector channels.

MICR processing requires either the direct control feature or the external interrupt feature.

Note 2: One 2400-series (7- or 9-track) or 3420 magnetic tape unit can be substituted for this device. The data-conversion feature is required if a 7-track tape unit is substituted for a card reader or a card punch. The data-conversion feature is not required if a 7-track tape unit is substituted for a printer.

A disk extent may be substituted for this device if 24K bytes of main storage are available.

Note 3: Same as Note 2, except the tape drive or disk extent cannot substitute the card reader as the communication device during system IPL time.

ADDITIONAL FEATURES

Additional features supported by the DOS system control are:

1. Timer feature.
2. Simultaneous read-while-write tape control (2404 or 2804).
3. Any channel configuration up to one multiplexor channel and six selector channels.
4. Tape switching unit (2816).
5. Storage-protection feature (required for multiprogramming).
6. Universal character set.
7. Selective tape listing features (1403) for continuous paper tapes.
8. Dual address adapter (1419) to allow more stacker selection processing. Once processing with the dual address adapter is established, 1412s and 1419s cannot be mixed.
9. Additional main storage up to 16,777,216 bytes.
10. The IBM 3215 Console Printer-Keyboard.

A minimum of 24K bytes is required for multiprogramming, BTAM, 1412/1419, 1255/1259, and 1270/1275 MICR document processing, and for assigning system I/O files to disk. The QTAM message control program requires a minimum of 32K bytes of main storage. The use of QTAM with two batched-job-foreground partitions requires a minimum of 64K bytes.

I/O DEVICES

IBM input/output devices supported by the DOS system control are:

1. 1442 Card Read Punch.
2. 2501 Card Reader.
3. 2520 Card Read Punch.
4. 2540 Card Read Punch.
5. 1403 Printer.
6. 1404 Printer (for continuous forms only).

7. 1443 Printer.
8. 1445 Printer.
9. 3211 Printer.
10. 1052 Printer-Keyboard for System/360; 3210 or 3215 console printer-keyboard for System/370.
11. 2671 Paper Tape Reader.
12. 1017 Paper Tape Reader with 2826 Paper Tape Control, Model 1.
13. 1018 Paper Tape Punch with 2826 Paper Tape Control, Model 1.
14. 2311 Disk Storage Drive.
15. 2314 Direct Access Storage Facility.
16. 2319 Disk Storage Facility.
17. 2321 Data Cell Drive.
18. 2400-series Magnetic Tape Units.
19. 3420 Magnetic Tape Unit.
20. 2495 Tape Cartridge Reader
21. 1285 Optical Reader (maximum of eight).
22. 1287 Optical Reader (maximum of eight).
23. 1288 Optical Page Reader (maximum of eight).
24. 1270 Optical Reader-Sorter (maximum number supported depends upon the system configuration).
25. 1275 Optical Reader-Sorter (maximum number supported depends upon the system configuration).
26. 1412 Magnetic Character Reader (maximum number supported depends upon the system configuration).
27. 1419 Magnetic Character Reader (maximum number supported depends upon the system configuration).
28. 1255 Magnetic Character Reader (maximum number supported depends upon the system configuration).
29. 1259 Magnetic Character Reader (maximum number supported depends upon the system configuration).
30. 1419P primary control unit address on 1275/1419 dual address adapter.

31. 1419S secondary control unit address on 1275/1419 dual address adapter.
32. 7770 and 7772 Audio Response Units
33. Teleprocessing devices specified in the BTAM and QTAM publications referenced in the Preface.

SYSTEM I/O DEVICES AND I/O FLOW

The I/O devices used to perform system input and output are called system units. The symbolic designations for the system units are:

- SYSRES (System Residence): an IBM 2311 Disk Storage Drive, an IBM 2314 Direct Access Storage Facility, or an IBM 2319 Disk Storage Facility selected for system residence.
- SYSLOG (System Log): an IBM 1052 Printer-Keyboard for System/360, or an IBM 3210 or 3215 Console Printer-Keyboard for System/370, or a printer selected for operator/system communication.
- SYSRDR (System Reader): a card reader, magnetic tape unit, or disk extent selected as the control-statement and foreground initiation input unit. See Note 1.
- SYSIPT (System Input): a card reader, magnetic tape unit, or disk extent selected as the primary system input unit. See Note 1.

Note 1: Optionally, SYSRDR and SYSIPT may both be assigned to the same DASD file. SYSIN is a name used when SYSRDR and SYSIPT are assigned to the same card reader or magnetic tape unit. This name must be used when SYSRDR and SYSIPT are assigned to the same disk extent.

- SYSLST (System List): a printer, magnetic tape unit, or disk extent selected as the primary printed output unit of the system.
- SYSPCH (System Punch): a card punch, magnetic tape unit, or disk extent selected as the primary punched output unit of the system. See Note 2.

Note 2: SYSOPT, of Basic Programming Support (BPS) and Basic Operating System (BOS), is equated to SYSPCH by macro generation in the DOS. SYSOUT is a name that must be used when SYSPCH and SYSLST are assigned to the same magnetic tape unit.

- SYSUSE: Logical unit block (LUB) used exclusively by system control to schedule all operator-initiated I/O unit manipulation.
- SYSLNK: a DASD device used primarily for I/O by the linkage editor program.
- SYSCLB: a DASD device (2311, 2314, or 2319) used for private core image libraries. See Note 3.
- SYSRLB: a DASD device (2311, 2314, or 2319) used for private relocatable libraries. See Note 3.
- SYS SLB: a DASD device (2311, 2314, or 2319) used for private source statement libraries. See Note 3.

Note 3: SYSCLB, SYSRLB and SYSSLB, if used, must be assigned to the same type device as is SYSRES.

- SYSREC: A DASD device (2311, 2314, or 2319) used to store Outboard Recorder (OBR), Statistical Data Recorder (SDR), IBM 2715 error records, Machine Check Recording and Recovery (MCRR), and Machine Check Analysis and Recording (MCAR) records. See Note 4.

Note 4: When the supervisor detects an error, an OBR, SDR, MCRR, or MCAR record is written on SYSREC. The EREP (Environmental Recording, Editing, and Printing) program edits this record and prints it on SYSLST. For System/370, EREP also creates or updates a history file.

These system units may be used by either background or batched-job foreground partitions.

Figure 1 shows system I/O flow.

	SYSRDR	SYSIPT	SYSPCH	SYSLST	SYSLOG	SYSLNK	SYSRES	SYSSLB	SYSRLB	SYSCLB	SYS000	SYS001	SYS002	SYS003
MAINT		IN		OUT	OUT		IN	IN	IN	IN				
MAINTA				OUT	OUT		I/O			I/O				
MAINTDR				OUT			I/O	I/O	I/O	I/O				
MAINTCN				OUT	OUT		I/O	I/O	I/O	I/O				
MAINTR2		IN		OUT			I/O		I/O					
MAINTS2		IN		OUT			I/O	I/O						
SLNKEDTC				OUT	OUT		I/O			OUT				
\$MAINEOJ				OUT			I/O			I/O			I/O*	I/O*
MAINTEJP				OUT				IN	IN	IN				IN*
MAINTUP		IN		OUT			I/O	I/O		I/O				
CORGZ		IN		OUT			IN							
CORGZ1							IN	OUT	OUT				OUT	OUT
CORGZ2							IN	OUT	OUT	IN	IN	IN	OUT	OUT
CORGZ3							I/O	I/O	I/O	I/O	IN	IN	I/O	IN
CORGZ4									IN			IN		
CORGZ5								IN			IN			
CORGZ6										IN				IN
CORGZ7								OUT	OUT					OUT
CORGZ8							IN						IN	
DSERV		IN		OUT			IN	IN	IN	IN				
CSERV		IN	OUT	OUT			IN			IN				
RSERV		IN	OUT	OUT			IN		IN					
SSERV		IN	OUT	OUT			IN	IN						
LINKAGE EDITOR				OUT	OUT	IN	I/O		IN	I/O		I/O		
JOB CONTROL	IN	IN		OUT	I/O	OUT (BG only)				I/O				

I/O= INPUT and OUTPUT
 * If called by CORGZ

Figure 1. System I/O Flow

SYSTEM COMPONENTS

The Disk Operating System is subdivided into the following functional components:

1. System residence
2. System control programs
3. Linkage editor program
4. Librarian programs
5. Processing programs

Figure 2 shows the relationship between the programs. Components 1-4 are discussed in the next four sections of this manual, with references to the PLMs that contain the detailed program logic information for the various programs in each component.

The processing programs use the functions of the control programs, as do all programs executed in the DOS environment. A minimum system residence may consist of only the system control programs and one or more user programs. A full system residence may consist of the following components:

1. System control programs
2. Linkage editor program
3. Librarian maintenance programs
4. Librarian organization programs
5. Librarian service programs
6. Processing programs
 - a. Language Translators
 - (1) Assembler
 - (2) COBOL
 - (3) FORTRAN
 - (4) RPG
 - (5) PL/I (D)
 - b. Sort/Merge

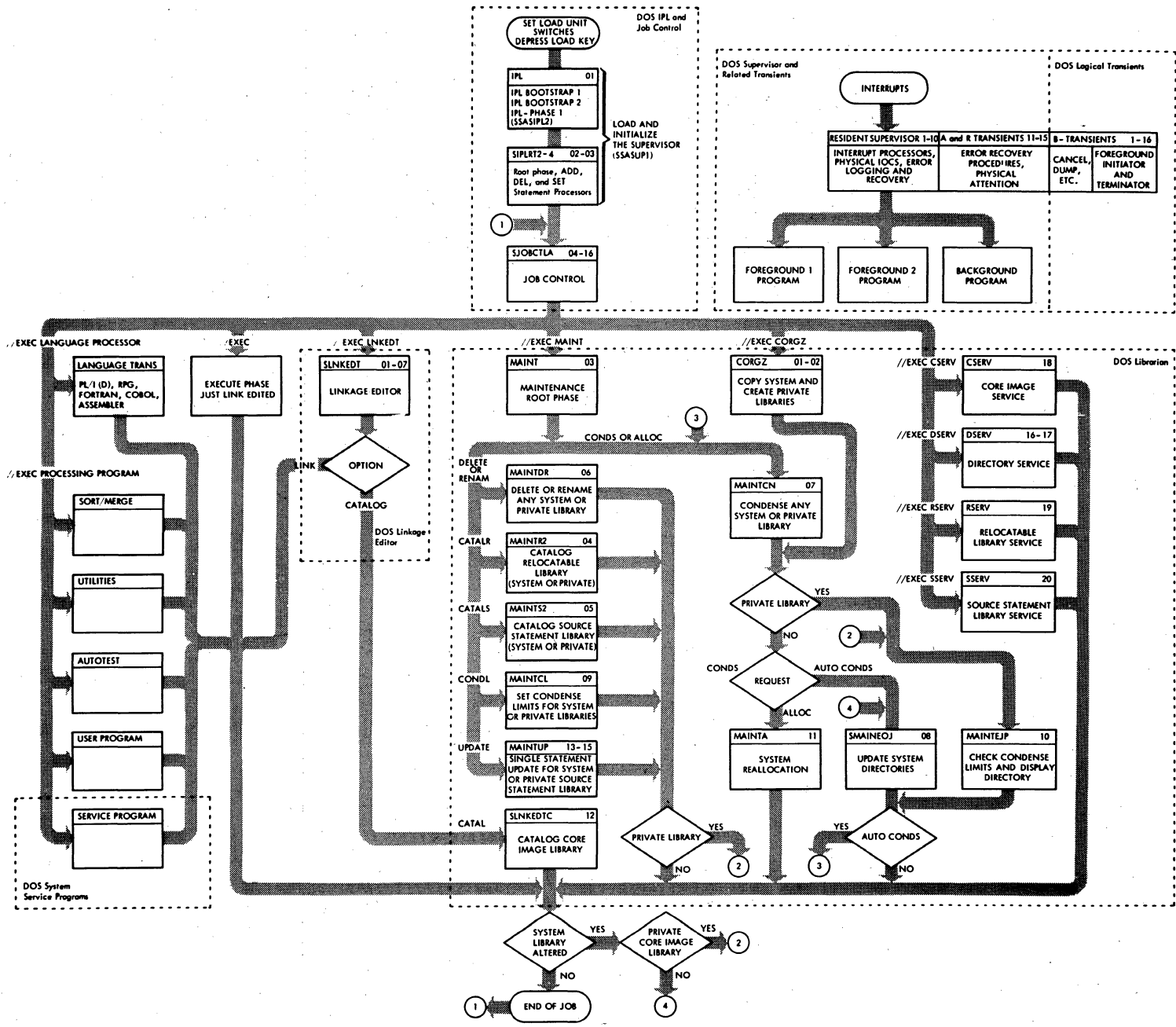
- c. Utilities
- d. Autotest (2311 support only)
- e. Problem Determination
- f. User programs

VERSION AND MODIFICATION LEVEL

To help identify programs in main storage when a dump is being analyzed, most of the phases and modules of the programs described in the seven system control PLMs have a 2-byte VM (version and modification level) number. The number may be in decimal or hexadecimal form in a core dump depending on the input format. It is in decimal form in a DSERV printout of the source statement, relocatable, or core image library. For example, version 3 modification level 0 appears as 0300 or F3F0 in a core dump and as 3.0 in a DSERV printout. The location of the VM number varies with the type of phase or module:

1. Transients. A- and B-transients contain, beginning at the load address, an eight-byte name, followed by a four-byte unconditional branch (B **6), followed by the two-byte VM number. For the logical transients \$\$BATTNA - \$\$BATTNP, the VM number appears in the specified location only in the root phase \$\$BATTNA which will be in core with any of these other transients at the time of a dump. The R-transients start with an eight-byte name field, followed by a two-byte VM number (entry point is at byte ten).
2. IPL, job control, librarian, tape error statistics by volume, and linkage editor. The modules in these programs contain, beginning at the load address, an eight-byte name followed by the two-byte VM number. For job control and linkage editor, the VM number appears in the specified location only in \$JOBCTLA and \$LNKEDT, respectively. These two root phases will be in core with any other associated phases in their respective programs at the time of a dump.

Figure 2. Disk Operating System Program Flow



In systems that have a supervisor with the SYSFIL option, the system logical units SYSRDR, SYSIPT, SYSIN, SYSLST and/or SYSPCH may be assigned to an extent on 2311, 2314, or 2319 disk storage device.

The system files on disk require the use of the job control statements ASSGN and CLOSE, and the supervisor channel scheduler routines.

When the parameters of the ASSGN statement are used, job control opens the file and initializes the disk information block (DIB) within the supervisor.

Each time a problem program requests I/O on a system logical unit, the supervisor checks the DIB table for a valid seek address. After each successful access to the file, the supervisor updates the current address field in the DIB for the particular symbolic device (SYSRDR, SYSIPT, etc.).

When a problem program issues an open to a system file that is currently assigned to disk, the LIOCS open routines transfer the extent information to the DTF table from the DIB instead of from the file label in the volume table of contents. This causes the current address field in the DIB to be used as the beginning extent for the DTF of the file being opened. When a problem program closes a system file that is assigned to disk, the LIOCS close routine posts the file closed but it will not alter the DIB. When the CLOSE statement is used, job control closes the system files on disk and deactivates the DIB.

The data set security feature (specified as a DLBL parameter) prevents unauthorized access to the user's confidential data files.

Considerations when using system files on disk are:

- The system logical units of SYSIPT, SYSRDR, SYSIN, SYSPCH, and SYSLST can be assigned to disk for any batched job partition.
- The creation of files for use as system input, and the printing or punching of system output files is done by user-written programs and utility programs (utility macros are available to simplify this).

- Predefined symbolic file names are to be used for all system files assigned to disk.
- When SYSRDR and SYSIPT are both assigned to disk, they must reside in the same extent and SYSIN must be used for the file name.
- SYSOUT cannot be assigned to disk. SYSLST and SYSPCH must be assigned to separate extents.

A residual capacity is established for SYSPCH and SYSLST files on disk at supervisor assembly time with the FOPT macro (SYSFIL parameter). These values can be changed after IPL by the job control command of SET (RCLST, RCPCH operands). Job control issues operator warning messages when the area assigned to disk is equal to or less than the specified value. This warning is given at the end of a job step; if the extent limits are exceeded before end-of-job, the job is terminated.

The assignment of system logical units to extents of disk storage must be permanent. The operator ASSGN command must be used instead of the programmer statement (// ASSGN). Temporary assignments (via the // ASSGN statement) to other device types are permitted. Thus, a job that is not in the input job stream on disk can be inserted in the stream by requesting a pause at the end of the current job, temporarily assigning SYSRDR to a card reader or a magnetic tape unit, and running the job. At completion, the assignment for SYSRDR reverts to the disk assignment.

PREDEFINED FILE NAMES

System input and output files are assigned to disk by providing a set of DLBL and EXTENT statements and then submitting a permanent ASSGN statement. The set of DLBL and EXTENT statements preceding the ASSGN statement may contain only one EXTENT statement.

The filename in the DLBL statement (which will be associated with the SYSxxx entry from the accompanying EXTENT statement) must be one of the following:

IJSYSIN for SYSRDR, SYSIPT, or the combined SYSRDR/SYSIPT file SYSIN

IJSYSPH for SYSPCH

IJSYSLS for SYSLST

Note that a combined SYSPCH/SYSLST file (SYSOUT) may not be assigned to disk.

In the DLBL statement, the "codes" operand must specify SD (or blank, which means SD) to indicate sequential DASD file type.

In the EXTENT statement, type may be 1 (data area, no split cylinder) or 8 (data area, split cylinder). There is no unique requirement for the remaining operands of the EXTENT statement.

The ASSGN statement must be one of the following:

1. ASSGN SYSIN,X'cuu' (for a combined SYSRDR/SYSIPT file).
2. ASSGN SYSRDR,X'cuu' (for SYSRDR only).
3. ASSGN SYSIPT,X'cuu' (for SYSIPT only).
4. ASSGN SYSPCH,X'cuu' (for SYSPCH).
5. ASSGN SYSLST,X'cuu' (for SYSLST).

Note that all must be permanent assignments (not preceded by //).

OPEN SYSTEM DISK FILES

Upon encountering a system input or output assignment to 2311, 2314, or 2319, job control performs the following functions:

1. Rejects the assignment if it is not permanent.
2. Rejects the assignment if a previous assignment to 2311, 2314, or 2319 for the same logical unit still exists (has not been closed).
3. Rejects the assignment if SYSRDR or SYSIPT are assigned to disk and a disk assignment already has been made for the other or both. (SYSRDR and SYSIPT must be a single combined file if both are on disk.)
4. OPENS the file. If input, the labels are checked. If output, DASD labels are written. Also, information is placed into the supervisor disk information block (DIB) for the problem program OPEN, and for monitoring of file operations by physical IOCS.

5. Unassigns the unit and requests further operator commands if the OPEN is unsuccessful.

CLOSE SYSTEM DISK FILES

System logical units assigned to disk must be closed by the operator. The operator CLOSE command must be used to specify a system input or output file which has been previously assigned to a 2311, 2314, or 2319. The optional second parameter (X'cuu') of the CLOSE command must be used (instead of an ASSGN command) to assign the system logical unit to a physical device. The system notifies the operator that a CLOSE is required when the limit of the file has been reached. If a program attempts to read or write beyond the limits of the file, the program will be terminated and the file must be closed.

The CLOSE function:

1. Writes a file mark if the file is an output file.
2. Resets the file's DIB in the supervisor by clearing the current address and setting the key and data length to zero.
3. Reassigns the logical unit to the value of the second operand of the CLOSE command.

SUPERVISOR FOPT MACRO PARAMETER

$$\text{SYSFIL} = \left\{ \begin{array}{l} \text{NO} \\ 2311 \\ 2314 \end{array} \right\} [n_1, n_2]$$

Specifies if system input and system output (SYSRDR, SYSIPT, SYSLST, SYSPCH) files may be assigned to a 2311, 2314, or 2319. Specification of either gives support for all. If MPS=BJF in SUPVR macro, support is given for foreground logical units when running in batched mode.

n_1 = residual capacity for beginning of operator notification when SYSLST is assigned to 2311, 2314, or 2319. $100 \leq n_1 \leq 65536$. If n_1 is omitted, 1000 is assumed.

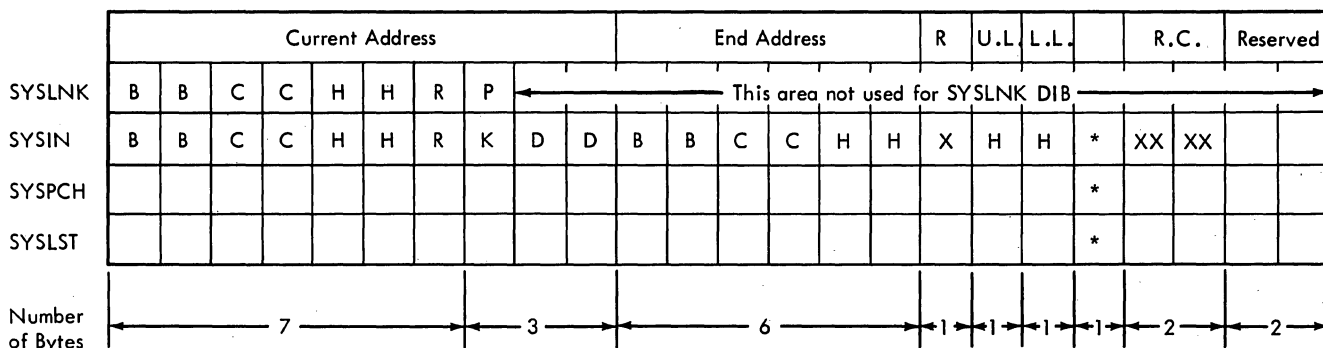
n_2 = residual capacity for beginning of operation notification when SYSPCH is assigned to 2311, 2314, or 2319. $100 \leq n_2 \leq 65536$. If n_2 is omitted, 1000 is assumed.

The job control command of SET with the RCLST and RCPCH operands, can change these values at any time after IPL.

time if the SYSFIL option was selected. It performs a recordkeeping function on system class units assigned to a DASD. The DIB contains the current seek address when the system is operating in a batched-job environment. The block is initialized by job control with extent information and is updated by physical IOCS.

DISK INFORMATION BLOCK (DIB)

The DIB illustrated in Figure 3 is built in the supervisor I/O table area at generation



- KEY: Current Address: The next address to be used (for both input and output).
 End Address : The last address within the limits of the extent.
 R : Maximum number of records per track.
 U.L. : Upper head limit
 L.L. : Lower head limit
 R.C. : Record Count - residual capacity for beginning of operator notification. This is set at system generation time with the SYSFIL parameter, or after IPL with the SET statement (RCLST and/or RCPCH operands). A warning message is issued by job control after end-of-job step when the minimum number of remaining records has been reached or exceeded during the previous job.
 P : Starting cylinder of Private Core Image Library, if PCIL is assigned.
 KDD : Key and data length for the symbolic device.

KDD for SYSIN = X'000050'
 KDD for SYSPCH = X'000051'
 KDD for SYSLST = X'000079'

Bytes 96 and 97 (X'60' - '61') of the communications region contain the address of the SYSLNK entry. Label DSKPOS identifies the first byte of the table.

Figure 3. Disk Information Block (DIB) Table

SYSTEM RESIDENCE ORGANIZATION

This section presents the organization of a disk resident system as received from the Program Information Department (PID) and after system generation. The disk resident system may be on a 2311, a 2314, or a 2319 disk pack, certain areas of which are predefined:

1. IPL. This area contains the IPL bootstrap program and the volume label.
2. System directory. This area contains the system master directory. It consists of records that show the status, location, description, and allocation of the core image library and its directory, and the starting addresses of the system relocatable library directory and the system source statement library directory. This area also contains the IPL retrieval program (\$\$A\$IPL2).
3. System work area (Librarian area). This area is reserved for use as a system work area by the linkage editor, job control, and the librarian programs.
4. Transient directory. This area contains the directory of the transient routines in the core image library.
5. Open (LIOCS) directory. This area contains a directory of the phases of the logical input/output control section (LIOCS) OPEN function.
6. Library-routine directory. This area contains a directory of the system programs in the core image library.
7. Foreground program directory. This area contains a directory of the foreground program phases.
8. Phase directory. This area is reserved for the directory of phases of a problem program.
9. Core image directory. This area contains the directory of all the phases in the core image library.
10. Core image library. This area contains the following programs, in core image format:
 - a. System control programs
 - (1) IPL program (\$IPLRT2)
 - (2) Supervisor control program (\$\$A\$SUP1), includes PIOCS.
 - (3) Job control program (\$JOBCTLA)
 - b. System Service Programs
 - (1) Linkage editor program (LNKEDT)
 - (2) Librarian programs
 - (a) maintenance programs (MAINT)
 - (b) organization programs (CORGZ)
 - (c) service programs
 - 1) directory service (DSERV)
 - 2) core image library service (CSERV)
 - 3) relocatable library service (RSERV)
 - 4) source statement library service (SSERV)
 - (3) System Buffer Load (SYSBUFLD)
 - c. Problem Determination Aids
 - (1) Fetch/Load, Generalized Supervisor Call, Input/Output, QTAM traces, and the transient dump
 - (2) Label Cylinder Display (LSERV)
 - d. Processing program: assembler (ASSEMBLY)
11. Relocatable library directory. This area contains the directory of all the modules in the relocatable library.
12. Relocatable library. This area contains programs in relocatable format (language translator output). All programs in the core image library, except the transients, are contained in this area. In addition, this area can contain the following programs:

- a. COBOL
- b. FORTRAN
- c. RPG
- d. PL/I (D)
- e. Sort/Merge
- f. Utilities
- g. Autotest
- h. Problem Determination Aids
 - (1) PDAID
 - (2) PDLIST
 - (3) DOS Stand-Alone Dump (DUMPGEN)
 - (4) Label Cylinder Display (LSERV)
 - (5) Environmental Recording Editing and Printing (EREP)
 - (6) Error Statistics by Tape Volume Utilities

- (a) ESTV File Format Program (ESTVFMT)
- (b) ESTV File Dump, Main Routine (ESTVUT)
- (c) ESTV File Dump, Printer Routine (ESTVPR)
- (d) ESTV File Dump, Magnetic Tape Routine (ESTVMT)

- 13. Source statement directory. This area contains the directory of all the books in the source statement library.
- 14. Source statement library. This area contains books in source-language format. The books supplied are macro definitions in the assembler sublibrary. Included are the supervisor macros and the logical IOCS macros.
- 15. Volume area. This file definition storage area (also referred to as the label cylinder) is on a separate cylinder. It contains standard and user labels for background and foreground partitions.

SYSTEM RESIDENCE ORGANIZATION AFTER GENERATION

Once system generation is completed, the user has a system residence specifically designed for his configuration and special features.

Certain areas of any system residence do not change. Figure 4 shows the organization of a full system residence.

For detailed information on the record formats for items 3 through 14 of Figure 4, refer to the DOS Librarian listed in the Preface.

- Items 1 through 10 and 15 in Figure 4 are required in any system residence.
- Items 1 through 9 have fixed locations.
- Items 10 through 16 have variable locations that are dependent on the existence and allocation (size) of preceding items.
- Items 11-14 and 16 are optional. If one or both of the optional libraries (items 12 and 14) are not allocated the associated directory is not allocated.
- The directory of each library-directory pair (items 9, 11, 13) starts on a new cylinder (CC) at track (HH) 00.
- The library of each library-directory pair starts on a new track (HH) and utilizes all of the last allocated cylinder (HH = 9).
- The volume area (item 15) requires a full cylinder.
- System residence is contained in a contiguous area of the disk pack. The starting and ending addresses are:

	BB	CC	HH	R
Start	00	00	00	1
End	00	nn	tt	n

where:

nn = the cylinder assigned to the volume area. nn depends on the allocation specified by the user for the core image, relocatable, and source statement library-directory pairs.

tt = 09 for 2311 or 19 for 2314 or 2319.

n = the last record of the last track of the volume area.

NO.	COMPONENT		STARTING DISK ADDRESS				NUMBER OF TRACKS (Allocation)	R=REQUIRED O=OPTIONAL
			BB	CC	HH	R		
1	IPL Bootstrap Record 1 (SASIPL1)		00	00	00	1	1	R
	IPL Bootstrap Record 2 (SASIPLA)		00	00	00	2		R
	Volume Label		00	00	00	3		R
	User Volume Label		00	00	00	4		O
2	System Directory	Record 1	00	00	01	1	1	R
		Record 2	00	00	01	2		R
		Record 3	00	00	01	3		R
		Record 4	00	00	01	4		R
	IPL Retrieval Program (SSASIPL2)		00	00	01	5	R	
3	System Work Area (Librarian Area)		00	00	02	1	3	R
4	Transient Directory (SSA and SSB Transients)		00	00	05	1	1	R
5	Open Directory (SSB0)		00	00	06	1	1	R
6	Library Routine Directory (\$ Phasenames)		00	00	07	1	1	R
7	Foreground Program Directory (FGP)		00	00	08	1	1	R
8	Phase Directory (For Problem Program Phases)		00	00	09	1	1	R
9	Core Image Library Directory		00	01 for 2311/ 00 for 2314/ 2319	00 for 2311 10 for 2314/ 2319	1	*	R
10	Core Image Library		00	End of CI Directory		1	*	R
				X	Y+1			
11	Relocatable Library Directory		00	End of CI Library		1	*	O
				Z+1	00			
12	Relocatable Library		00	End of RL Directory		1	*	O
				X	Y+1			
13	Source Statement Library Directory		00	End of RL Library		1	*	O
				Z+1	00			
14	Source Statement Library		00	End of SS Directory		1	*	O
				X	Y+1			
15	Volume Area File Definition Storage Area			End of SS Library		1	2311:10 2314/2319:20	R
				Z+1	00			
16	User Area			End of Volume Area		1	*	O
				Z+2	00			

*Allocation Dependent On User Requirements
X=Ending CC of the Preceding Directory
Y=Ending HH of the Preceding Directory
Z=Ending CC of the Preceding Library

Figure 4. System Residence Organization

IPL

Refer to DOS IPL and Job Control listed in the Preface for information on IPL record formats.

VOLUME LABEL

The volume label contains the address of the Volume Table of Contents (VTOC) established when the pack was initialized (see field 5 in Figure 5). A brief description of the VTOC appears in Appendix D.

SYSTEM DIRECTORY

This directory consists of five records that make up the system master directory. Records 1 through 4 are 80 bytes in length.

Record 1 contains information describing the system core image library and directory. Records 2 and 3 contain the starting address of the system relocatable library directory and the system source statement library directory, respectively. Record 4 is not used. Record 5 is the IPL retrieval program (\$\$A\$IPL2).

SYSTEM WORK AREA (LIBRARIAN AREA)

This 3-track area is reserved as a work area for the librarian programs and job control. The format of the records in the librarian area depends on the program using the area at a specific time.

TRANSIENT DIRECTORY

This single track directory contains entries for the A and B transient routines, which are located in the core image library. The entries in this directory are taken from the core image library directory. A separate directory permits faster retrieval of the A and B transients.

The core image library phases that are referenced in this directory have a phase name prefixed by \$\$A (type A transients) or \$\$B (type B transients). This directory

has a maximum capacity of 144 entries for the 2311, or 270 entries for the 2314 or 2319. Track format is identical to the core image library directory.

OPEN DIRECTORY

This single track directory contains entries for the LIOCS open phases located in the core image library. The entries in this directory are taken from the core image library directory. A separate directory permits faster retrieval of LIOCS open phases. The core image library phases referenced in this directory have phase names prefixed by the characters \$\$B0. This directory has a maximum capacity of 144 entries for the 2311, or 270 entries for the 2314 or 2319. Track format is identical to the core image library directory.

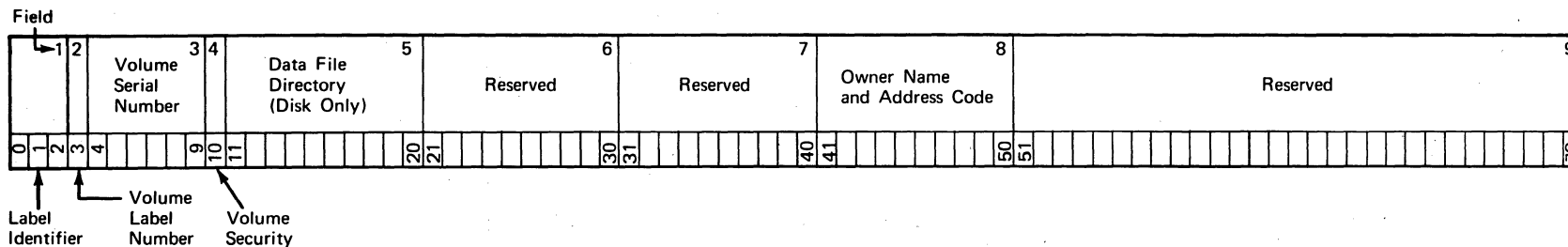
LIBRARY ROUTINE DIRECTORY

This single-track directory contains entries for frequently used core image library phases, such as job control, linkage editor, etc. The entries in this directory are taken from the core image library directory. A separate directory permits faster retrieval of these phases. The core image library phases that are placed in this directory have a phase name prefixed by a \$ (for example, \$LNKEDT). This entry has a maximum capacity of 144 entries for the 2311, or 270 entries for the 2314 or 2319. Track format is identical to the core image library directory.

FOREGROUND PROGRAM DIRECTORY

This single track directory contains entries for the foreground program phases located in the core image library. The entries in this directory are taken from the core image library directory. A separate directory permits faster retrieval of foreground program phases. The core image library phases referenced in this directory have phase names prefixed by the characters FGP. This directory has a maximum capacity of 144 entries for the 2311, or 270 entries for the 2314 or 2319. Track format is identical to the core image library directory.

Figure 5. Standard Volume Label Data



Volume Label Format (80 bytes) for Tape or DASD.

FIELD	NAME AND LENGTH	DESCRIPTION	FIELD	NAME AND LENGTH	DESCRIPTION
1.	<u>LABEL IDENTIFIER</u> 3 bytes	Must contain VOL to indicate that this is a Volume Label.	5.	<u>DATA FILE DIRECTORY</u> 10 bytes	For DASD only. The first 5 bytes contain the starting address (CCHHR) of the VTOC. The last 5 bytes are blank. For tape files, this field is not used and should be recorded as blanks.
2.	<u>VOLUME LABEL NUMBER</u> 1 byte	Indicates the relative position (1-8) of a volume label within a group of volume labels.	6.	<u>RESERVED</u> 10 bytes	Reserved.
3.	<u>VOLUME SERIAL NUMBER</u> 6 bytes	A unique identification code that is assigned to a volume when it enters an installation. This code may also appear on the external surface of the volume for visual identification. It is normally a numeric field 000001 to 999999. However, any or all of the 6 bytes may be alphameric.	7.	<u>RESERVED</u> 10 bytes	Reserved.
4.	<u>VOLUME SECURITY</u> 1 byte	Indicates security status of the volume: 0 = No further identification for each file of the volume is required. 1 = Further identification for each file of the volume is required before processing.	8.	<u>OWNER NAME AND ADDRESS CODE</u> 10 bytes	Indicates a specific customer, installation and/or system to which the volume belongs. This field may be a standardized code, name, address, etc.
		Not used by DOS (See Note 3 for exception).	9.	<u>RESERVED</u> 29 bytes	Reserved.

For display only when VTOC is displayed by use of DSPLYV

Note 1: All reserved fields should contain blanks to facilitate their use in the future. Any information appearing in these fields at the present time is ignored by the Disk Operating System programs as well as the Operating System programs.

Note 2: This figure shows only the data field of the label. For DASD, a 4-byte key field precedes this data field.

Note 3: OLTEP and OLTSEP will access this byte to determine if the volume is security protected. If the byte contains anything other than X'F0' or X'00' OLTEP and OLTSEP will not allow any further accessing of this volume by on-line tests.

PHASE DIRECTORY

This single track directory contains entries for the phases of the current BG problem program. The entries in this directory are constructed by job control before each job step is executed in the background partition only. They are taken from the core image library directory. A separate directory permits faster retrieval of the phases of a program. This function is also performed for the current foreground program if link-edit and GO operations are performed.

The phase naming conventions used to permit the use of the phase directory are:

1. All program names must be unique in the first four characters.
2. The first four characters of the name of each phase of a program must be identical to the first four characters of the program name. All eight characters of the first phase name must be identical to the program name.

Example: WXYZPROG

WXYZPROG - phase 1

WXYZPH1 - phase 2

WXYZPH2 - phase 3

The maximum capacity of this directory is 144 entries for the 2311 or 270 entries for the 2314 or 2319. Track format is identical to the core image library directory.

SYSTEM CORE IMAGE LIBRARY DIRECTORY

This directory consists of one or more tracks, depending on the allocation specified by the user. It contains one entry for each of the phases in the core image library.

Note: A phase is an overlay of a multiphase program or a complete program if not multiphase.

Each directory entry describes one phase in the core image library and contains:

- Phase name
- Loading address
- Number of blocks

- Entry point
- Starting disk address in the core image library
- Length of last block.

SYSTEM CORE IMAGE LIBRARY

The system core image library consists of five or more tracks, depending on the allocation specified by the user. For the 2311, each track contains two blocks with a maximum capacity of 1728 bytes each. For the 2314 or 2319, each track contains four blocks with a maximum capacity of 1688 bytes each. The number of programs (phases) and the size of each program to be contained in the core image library dictates the number of cylinders that must be allocated. Each program starts with a new block and only the last block of a program can contain less than 1728 bytes of data for the 2311 or 1688 bytes of data for the 2314 or 2319.

SYSTEM RELOCATABLE LIBRARY DIRECTORY

This directory consists of one or more tracks, depending on the allocation specified by the user. It contains two types of information:

1. System directory information for the relocatable directory and library. This information will occupy the first five entries of the first record in the relocatable directory.
2. An entry that describes each module in the relocatable library and contains:
 - a. Module name (see Note)
 - b. Total number of text-record blocks required to contain this module
 - c. Starting disk address of the first text-record of this module
 - d. Change level identification.

Note: A module is the output of a complete language translator run.

SYSTEM RELOCATABLE LIBRARY

The system relocatable library consists of five or more tracks, depending on the allocation specified by the user. The number of modules and the size of each module to be contained in this library dictates the number of tracks that must be

allocated. Each allocated track contains nine blocks (2311) or 16 blocks (2314 or 2319), and each block has a fixed length of 322 bytes. Each module starts with a new block but not necessarily a new track.

SYSTEM SOURCE STATEMENT LIBRARY DIRECTORY

This directory consists of one or more tracks, depending on the allocation specified by the user. It contains two types of information:

1. System directory information for the source-statement directory and library. This information occupies the first five entries of the first record in the source-statement directory.
2. An entry that describes each book (see Note 1) in the source statement library and contains:
 - a. A sublibrary prefix - any alphameric character, \$, #, or @, except A and C (see Note 2.)
 - b. Book name
 - c. Starting disk address of the first block of this book
 - d. Total number of blocks required to contain this book in the source statement library
 - e. Change level identification.

Note 1: A book is a sequence of source language statements, in compressed card image format, accessed by a single name. See the figure entitled Compressed Format for Source Statement Library in the DOS Librarian listed in the Preface.

Note 2: A and C are reserved for Assembler and COBOL, respectively.

SYSTEM SOURCE STATEMENT LIBRARY

The system source statement library consists of five or more tracks, depending on the allocation specified by the user. The number of books and the size of each book to be contained in this library dictates the number of tracks that must be allocated. Each track contains 16 blocks (2311) or 27 blocks (2314 or 2319), and each block has a fixed length of 160 bytes. Each book starts with a new block but not necessarily a new track. Each book in the source statement library contains compressed card images of the source language input to the assembler or COBOL language translators. A compressed card image can overflow from one block to another.

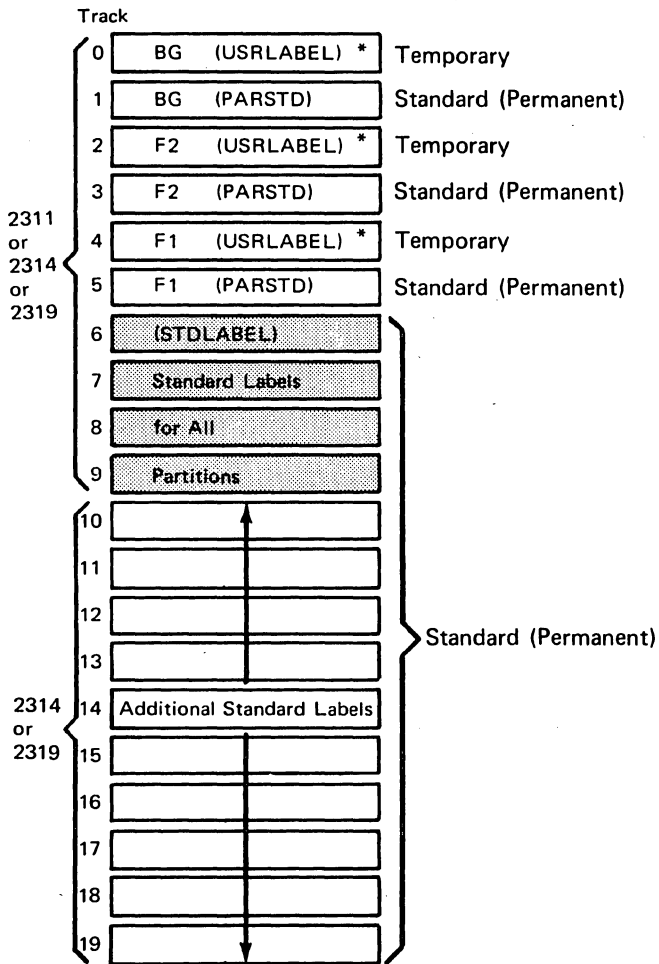
VOLUME AREA

The volume area consists of ten tracks (2311) or twenty tracks (2314 or 2319) on a separate cylinder. It contains background and foreground user and standard label information.

Figure 6 shows the label cylinder track allocation for the devices.

LABEL INFORMATION CYLINDER

(First Full Cylinder after Last Library on SYSRES)



* Label sets submitted in a job stream without a //OPTION PARSTD,STDLABEL are written to the temporary area for the partition being used.

Figure 6. Label Cylinder (Volume Area) Track Allocation

CONTROL PROGRAMS

INITIAL PROGRAM LOADER (IPL)

The IPL program must be executed each time it is necessary to load a new supervisor control program or to change the channel and unit assignment for SYSRES.

The IPL program:

1. Operates in the supervisor mode.
2. Loads supervisor into core from SYSRES.
3. Performs any ADDs and DELETES of devices to the supervisor PUB table.
4. Determines whether System/360 or System/370 is used.
5. Stores CPU identification.
6. Initializes RMS (Recovery Management Support) if included. When RMS is included for System/360, the option is ignored, and machine-check and channel-check errors cause the system to enter a hard wait.
7. Sets the date and time of day (if supported) into supervisor communications region.
8. Places the system in the problem mode.
9. Exits to EOJ when it is finished.

For detailed information and flowcharts, see the DOS IPL and Job Control listed in the Preface.

JOB CONTROL PROGRAM

The job control program provides job-to-job transition for:

- Background programs
- Foreground programs if MPS=BJF (batched-job-foreground) option is specified.

This program also prepares job steps for execution. (One or more programs can be executed within a single job. Each such execution is called a job step.)

For foreground programs operating in other than BJT environment, job-control type functions are performed by the single program initiator.

Job control performs various functions on the basis of information provided in job control statements. These functions are:

- Preparing the system for execution of programs in a batched-job environment.
- Assigning device address to symbolic units.
- Setting up fields in the communications region(s).
- Editing and storing volume and file label information.
- Preparing for restarting checkpointed programs.
- Clearing the problem program area to binary zero between job steps.

Job control is executed in the problem program area and is overlaid by the job step it is preparing to execute. For detailed information and flowcharts, see the DOS IPL and Job Control listed in the Preface.

SUPERVISOR

The supervisor program operates with problem programs when job processing (problem program execution) occurs. The supervisor program is divided into two parts:

1. the resident part called the supervisor nucleus
2. the nonresident part called a supervisor transient.

The nucleus is loaded into main storage at IPL time and remains there throughout job processing. A transient (one of many) is loaded from the core image library of SYSRES as needed. When a transient has finished performing its service, it can be overlaid by some other transient when some other type of service is required. This technique maximizes the use of main storage allotted to the supervisor.

Directories for the core image library are read in the Independent Directory Read-in Area (IDRA) if the option is specified at system generation time. This feature reduces contention for the physical transient area, where directories are read in if the option is not taken, and improves overall system performance in a multiprogramming environment.

Each installation must generate its own tailor-made supervisor by means of a one-time assembly. Supervisor generation macros control the generation of the supervisor control program. Reassembly is required whenever the user wants to change the capability of the supervisor. An example of this is when the installation configuration changes.

The supervisor contains a communications region for holding information useful to problem programs and to the supervisor itself. In a batched-job environment a communications region is generated for each partition.

All functions except certain interrupt handling (SVC, I/O, and machine check) are available to the problem program by issuing macro instructions. The programmer is not concerned with machine interrupt conditions, because these are handled automatically by the supervisor.

The basic functions performed by the supervisor are:

- Storage protection (required for multiprogramming)
- Interrupt handling
- Channel scheduling
- Device error recovery
- Operator communications
- Program retrieval (fetch or load)
- End-of-job processing

Some of the options of the supervisor specified at system generation time are:

- Timer services
- Error logging and recovery
- Machine Check Recording and Recovery
- Recovery Management Support
- Tape Error Block
- Error Statistics by Tape Volume

- Error Volume Analysis
- Job Accounting Interface
- American National Standard Code for Information Interchange (ASCII)

The timer option supports the GETIME macro that provides the time of day at any time during program execution.

Error logging and recovery procedures are done by the I/O Error Logging (ERRLOG) and Machine Check Recording and Recovery (MCRR) routines. These routines collect information about the reliability of the hardware. The environment records produced facilitate diagnosis and repair of a system and thus reduce the occurrence of interrupts due to hardware failure. The system recovery portion of the MCRR function reduces the number of conditions that cause the system to enter an uninterruptable wait state. System recovery is accomplished by canceling all affected partitions.

When MODEL= a System/370 CPU is specified in the CONFIG macro, the Recovery Management Support (RMS) is automatically included for the IBM System/370. This feature consists of two functions: MCAR (Machine Check Analysis and Recording) and CCH (Channel Check Handler). Machine-check processing responds to the MCI (Machine Check Interrupt) and performs functions that maximize reliability, availability, and serviceability. Such MCAR functions as error correction and selective job termination allow system continuation for all recoverable and some nonrecoverable failures. On channel-error conditions, CCH and its ERP (Error Recovery Procedures) attempt to either retry the error or terminate the affected partition. MCAR and CCH record pertinent error information on the ERDS (Environmental Recording Data Set).

Tape Error Block (TEB) support writes magnetic tape file status on SYSLOG at the end of every job using those files. The status information contains the number of permanent read/write errors that were encountered and those errors that were recovered by the system through the use of error routines.

DOS volume statistics is a facility to monitor the number of read and write errors per volume stored in IBM 2400 series tape. This facility has two options: Error Statistics by Tape Volume (ESTV), and Error Volume Analysis (EVA).

Error Statistics by Tape Volume (ESTV) assigns to each tape unit on a system a set of counters within the program for

recording tape errors occurring on any volume mounted on the units specified at system generation time. Each time a tape error is encountered, the appropriate temporary error counter is incremented by a tape error recovery procedure (ERP) routine. Retries during the ERP do not increment the error counters, but they do increment a retry counter, which is reset to zero upon recovery or failure. Upon failure, ESTV increments the permanent error counter.

When volume usage is ended by CLOSE, EOJ, or EOJ, the error statistics collected for that volume are written to the output device selected at system generation, and the ESTV counters for the unit containing the volume are reset to zero.

Error Volume Analysis (EVA) is selected at system generation time by specifying threshold values and number of devices in the FOPT system generation macro. The values specified are the number of temporary read and temporary write errors per volume. Whenever either the read or write threshold is exceeded, the program writes a message to SYSLOG and continues execution.

The maximum threshold value that is allowed for read and write errors is 254 each. The n field of the EVA parameter must be the same as specified for TEB and/or TEBV, if either or both of these options are included in the system. If a number greater than 254 is specified for either read or write, EVA is not implemented.

The job accounting interface accumulates job information about system usage. It can be used in scheduling more efficient system operation and in providing a basis for planning new applications. A minimum of 24K bytes of main storage is required to support job accounting interface.

The supervisor provides EBCDIC to ASCII or ASCII to EBCDIC translate tables if specified at system generation time. ASCII tape files can be either unlabeled or labeled according to the specifications of the American National Standards Institute, Inc. (ANSI).

For detailed information and flowcharts, see the DOS Supervisor and Related Transients and the DOS Logical Transients listed in the Preface.

All programs to be executed in the DOS environment must be link-edited and stored in the core image library before they can be executed. The core image library is either on SYSRES or SYSCLB. The link-edit function is accomplished by the linkage editor program operating in one of three modes:

1. Catalog mode. An object module is link-edited and permanently stored in the core image library. The core image and system directories are updated in this mode of operation.
2. Load and execute mode. An object module is link-edited for temporary storage in the core image library and is immediately executed.
3. Assemble and execute mode. A source module is assembled or compiled. The object module (output) is link-edited for temporary storage in the core image library and is immediately executed.

Note: When you are operating in modes 2 or 3, the core image and system directories are not updated. You cannot use modes 2 and 3 if the program name begins with a \$ and it has been previously cataloged into the core image library.

The extent of the editing function performed depends on the structure of the input program. The simplest case is that of a single-module program. The linkage editor has only to edit the program, creating a single phase entry in the core image format. In more complex situations, the operation may involve linking together and relocating multiple-control sections from separate assemblies to produce a number of separate phases. The linkage editor resolves all linkages (symbolic reference) between segments of the program and relocates the phases to load at specified main-storage locations.

To facilitate writing and testing large programs, assembled program modules cataloged in the relocatable library can be combined with other modules from SYSIPT (card, tape, or disk).

You can run the linkage-editor program in either the background or a foreground

partition. If it is run in a foreground partition, you must assign a private core image library (SYSCLB). In the background partition the linkage editor defaults to the system core image library if no private core image library is assigned. You cannot assign the private core image library across partitions when executing the linkage editor. The linkage editor cancels if it encounters a cross-assigned private core image library.

The linkage editor consists of seven phases. The phase names and functions are:

Phase Name	Function
\$LNKEDT	Initialize/Overhead
\$LNKEDT0	12-2-9 Processor (ESD only)
\$LNKEDT2	12-2-9 Processor (Other than ESD)
\$LNKEDT4	Control Card Processor
\$LNKEDT6	Control Card Processor
\$LNKEDT8	MAP Processor
\$LNKEDTA	Pass 2 Processor

The job control program fetches the first phase (\$LNKEDT) when the program reads a // EXEC LNKEDT control statement. Main storage availability is the determining factor in fetching the remaining linkage-editor phases.

If less than 14K available main storage is found, a two-part initialization is done. When fetched, \$LNKEDT0 overlays the initialization part of \$LNKEDT, leaving the overhead part for use by the other phases. When the program finishes processing an ENTRY card (in \$LNKEDT6), the MAP and Pass 2 processors are fetched and executed sequentially. \$LNKEDTA fetches job control. This is the normal end of the linkage-editor function. If, however, \$LNKEDTA detects the CATAL option as being specified, \$LNKEDTC is fetched instead of job control. See Librarian Programs.

LIBRARIAN PROGRAMS

The librarian programs organize, maintain, and service the system libraries and directories of the Disk Operating System and, when desired, create, maintain, and service private libraries and directories. These programs are collectively referred to as the librarian. The system residence (SYSRES) can contain three separate libraries, each with its own directory:

1. Core Image Library. All programs in the system (IBM-supplied and user programs) are loaded from this library by the system loader routine of the supervisor.
2. Relocatable Library. This library stores object modules which can be used for subsequent linkage with other program modules. A complete program of one or more modules can be placed in this library.
3. Source Statement Library. This library stores IBM-supplied macro definitions and user-defined source statements routines (such as macro definitions) in the resident pack built to provide extended program-assembly capability.

The core image library is required for each disk-resident system. The other two libraries are not required for operating a system.

Private core image libraries (SYSCLB), private relocatable libraries (SYSRLB), and private source statement libraries (SYSSLB), each with its own directory, are also supported. Private libraries are in the same format as the system libraries and may be on the same pack as SYSRES. If they are not on the SYSRES pack, they must be on a pack of the same type as SYSRES. Refer to Private Libraries in this manual.

The librarian is divided into three groups by major function:

1. Organization programs
2. Maintenance programs
3. Service programs

For detailed information and flowcharts, see the DOS Librarian listed in the Preface.

ORGANIZATION PROGRAMS

The copy system program (CORGZ) is the only program in this category. It is fetched by job control when the // EXEC CORGZ control statement is read. CORGZ copies SYSRES either selectively or completely onto SYS002. It merges from one library to another, either selectively or completely, without the necessity of generating punched card output and recataloging. CORGZ also creates private files and copies SYSRES portions onto SYSRLB, SYSSLB, and/or SYS003 for the private core image library. A complete copy onto SYS002 generates backup, a selective copy generates a reduced system that is to be used for a specific purpose.

The CORGZ program has the additional capability of performing the reallocation function.

Upon completion of the copy run onto SYS002, the CORGZ program fetches \$MAINEOJ to update the transient and library-routine directories on SYSRES and to print the system status report of the new SYSRES. If the copy was for private files, MAINTTEJP is fetched to print the private status report.

The CORGZ program has nine phases. CORGZ, the root phase, contains tables and switches necessary to interface between its related processing phases. CORGZ1 handles the copy card after a NEWVOL or ALLOC card and creates directories in preparation for fetching CORGZ2 to build libraries.

CORGZ3 processes the COPY statement after a MERGE card and fetches either CORGZ4, CORGZ5, or CORGZ6, which opens files for merging relocatable, source statement, or core image libraries, respectively, and initializes the proper interfacing tables and switches. CORGZ7 processes NEWVOL and ALLOC statements; CORGZ8 processes the MERGE card.

MAINTENANCE PROGRAMS

These programs perform the functions that catalog, delete, rename, update, reallocate and condense the libraries:

1. Common library maintenance program (MAINT).

- | | | |
|--|---|--|
| <ul style="list-style-type: none"> 2. Core image library catalog program (\$LNKEDTC) 3. Relocatable library catalog program (MAINTR2). 4. Source statement library catalog program (MAINTS2). 5. Delete or rename program for all libraries (MAINTDR). 6. System reallocation program (MAINTA). 7. Set condense limits program (MAINTCL). 8. Library condense program (MAINTCN). 9. Update sub-directories and print status report program for SYSRES (\$MAINEOJ). 10. Private library condense check and status report program (MAINTEJP). 11. Source statement library single statement update program (MAINTUP) | <ul style="list-style-type: none"> • ALLOC • RDRCTL | <p>Fetch MAINTCN</p> <p>MAINT fetches MAINTCN when an ALLOC or CONDS statement is read. MAINTCN performs the library condense function before fetching MAINTA to perform the reallocation function specified by the ALLOC control statement.</p> <p>This statement results in the same functions as a /* or /*& statement:</p> <ol style="list-style-type: none"> 1. Fetch MAINTEJP if any private libraries were assigned. 2. Cancel if a private status report was made. 3. Fetch job control if no private library was assigned. |
|--|---|--|

\$LNKEDTC is called by the linkage editor if the job control bit is on for the CATAL option.

COMMON LIBRARY MAINTENANCE PROGRAM (MAINT)

This program is in storage during the execution of all system maintenance functions except \$LNKEDTC and \$MAINEOJ. It is called by job control when a // EXEC MAINT control statement is read or by \$MAINEOJ if an automatic condense is required.

The primary function of MAINT is to fetch the correct maintenance program to perform a specific maintenance function. This is accomplished by reading and analyzing control statements from SYSIPT. The following is a list of control statements acceptable to MAINT:

- | | |
|--|---|
| <ul style="list-style-type: none"> • RENAMC RENAMR RENAMS DELETC DELETR DELETS • CATALR • CATALS • CONDL • UPDATE • CONDS | <ul style="list-style-type: none"> Fetch MAINTDR Fetch MAINTR2 Fetch MAINTS2 Fetch MAINTCL Fetch MAINTUP Fetch MAINTCN (also see ALLOC) |
|--|---|

CORE IMAGE LIBRARY CATALOG PROGRAM (\$LNKEDTC)

\$LNKEDTC is called by \$LNKEDTA when the option catalog bit is on (displacement 57 in the supervisor communications region). \$LNKEDTC catalogs the program to the core image library by adding an entry to the core image directory on SYSRES or SYSCLB for each phase of the program being cataloged. The phase entries are built by a previous phase of the linkage editor in the system work area (also referred to as the librarian area). Refer to Figure 4 for the location of the system work area. If a phase being cataloged has the same name as a phase already in the directory, the phase in the directory is deleted by \$LNKEDTC.

RELOCATABLE LIBRARY CATALOG PROGRAM (MAINTR2)

This program is fetched by MAINT, when a CATALR statement is recognized, to catalog a module in the relocatable library on SYSRES or on SYSRLB if it was assigned. When fetched, MAINTR2 shares the background problem program area with MAINT. When the catalog is completed, control is returned to MAINT to read another card.

SOURCE STATEMENT LIBRARY CATALOG PROGRAM
(MAINTS2)

This program is fetched by MAINT when a CATALS statement has been read to catalog books to the source statement library on the system residence or private files. When fetched, MAINTS2 shares the problem program area with MAINT. Control is returned to MAINT when the catalog is completed.

DELETE AND RENAME FOR ALL LIBRARIES PROGRAM
(MAINTDR)

MAINTDR is fetched by MAINT upon recognition of a DELET or RENAM statement. The delete function is performed by blanking the name area of the appropriate phase(s), module(s), or book(s). The rename function is performed by replacing the old name of the phase, module, or book with the specified new name. Upon completion of the specified deleting or renaming, control is returned to MAINT.

SOURCE STATEMENT LIBRARY SINGLE STATEMENT
UPDATE PROGRAM (MAINTUP)

This program is fetched by MAINT when an UPDATE card is read to add, delete, and replace statements in books of the system residence or private source statement library. When fetched, MAINTUP shares the problem program area with MAINT. Provision is made for change level verification and for statement resequencing. Upon completion of this phase, control is returned to MAINT.

SYSTEM REALLOCATION PROGRAM (MAINTA)

MAINTA is fetched by MAINTCN when an ALLOC control statement is detected by MAINT. The reallocation function is used to redefine the sizes of the libraries and directories of the system residence file.

MAINT detects the ALLOC control statement and fetches MAINTCN to condense all libraries (on 2311, 2314, or 2319) before fetching MAINTA. When fetched, MAINTA overlays MAINTCN and shares the problem program area with MAINT. After the reallocation is performed, control is then returned to MAINT.

SET CONDENSE LIMITS PROGRAM (MAINTCL)

This program is fetched by MAINT when a CONDL statement is recognized. When executed, MAINTCL stores library condense information in the system directory of the system residence or private file. This stored information is used by \$MAINEOJ or MAINTTEJP to determine if an automatic condense is required.

LIBRARY CONDENSE PROGRAM (MAINTCN)

This program is fetched by MAINT to perform the condense function for the system residence and private libraries. When fetched, MAINTCN shares the problem program area with MAINT.

The CONDS control statement specifies that one of the following condense functions must be performed and that control is returned to MAINT:

- Condense all libraries
- Condense selected libraries
- Condense a specific library

MAINTCN is also fetched by MAINT (via \$MAINEOJ for automatic condensing), by MAINTTEJP for private library automatic condensing, or by MAINT when an ALLOC control statement is read. When the last condition exists, all SYSRES libraries are condensed and MAINTA is fetched when the condense is completed.

UPDATE SUBDIRECTORIES PROGRAM (\$MAINEOJ)

This program may be fetched by MAINTCN (in the case of an automatic condense), by job control, by CORGZ, or by MAINTTEJP. It updates the transient, foreground program, open, and library-routine directories, and it prints the SYSRES system status report on SYSLST after the completion of any maintenance run for SYSRES or a copy system function to SYS002.

PRIVATE LIBRARY CONDENSE LIMIT CHECK AND
STATUS REPORT PROGRAM (MAINTTEJP)

This program may be fetched by CORGZ, MAINTCN, MAINT, or job control at the end-of-job-step where private libraries were assigned. If the program is fetched

by MAINT, MAINTCN, or job control, MAINTTEJP checks the condense limits and fetches MAINTCN if necessary. It also displays the private status report on SYSLST. If MAINTTEJP is fetched by CORGZ, only the display function is performed.

SERVICE PROGRAMS

These programs perform the functions of:

1. Displaying and/or punching phases from the core image library, modules from the system residence and private relocatable libraries, and books from the system residence and private source statement libraries.
2. Displaying the contents of any or all of the directories of the system residence and private files with either an alphamerically sorted listing of the directory entries or a listing of the entries as they appear in the directory.

DIRECTORY SERVICE PROGRAM (DSERV)

This program prints the system status report. If private libraries are assigned, the program also prints private status report(s). The program then displays the contents of the specified directories. If private libraries are assigned, the program displays private directories in place of system directories. To display system directories when private libraries are assigned, unassign the private libraries. Any combination of directories can be displayed, depending on libraries assigned and operands specified.

You can display the directories with either an alphamerically sorted listing of the directory entries or a listing of the entries as they appear in the directory. You can also display the version and modification level of any core image library phase or group of phases if present.

CORE IMAGE LIBRARY SERVICE PROGRAM (CSERV)

This program displays and/or punches phases, programs, or the complete core image library on SYSRES or SYSCLB.

RELOCATABLE LIBRARY SERVICE PROGRAM (RSERV)

This program displays and/or punches modules, programs, or the complete relocatable library of SYSRES or SYSRLB.

SOURCE STATEMENT LIBRARY SERVICE PROGRAM (SSERV)

This program displays and/or punches books, sublibraries, or the complete source statement library of SYSRES or SYSSLB.

PRIVATE LIBRARIES

Three types of private directories and libraries are supported:

1. Private core image library directory and private core image library.
2. Private relocatable library directory and private relocatable library.
3. Private source statement library directory and private source statement library.

The private libraries may be on SYSRES; if not, they must be on the same type disk pack (2311, 2314, or 2319) as the system residence pack. Private core image libraries require a minimum of 20 contiguous tracks.

Several private libraries may be on the same disk pack, but in such cases they must have different file identifications. For example, if two private source statement libraries have the same file name IJSYSSL, their file identifications could be ONEPRSL and TWOPRSL. The organization of each private core image library is the same as system residence organization (see Figure 4, items 1 through 10). The areas for the IPL bootstrap records, volume label, user volume label, system directory records 2-4 and the IPL retrieval program are not used in a private core image library.

A private core image library can be assigned to any batched-job partition having a minimum of 10K bytes of storage. A partition can have only one private core image library assigned to it at a time. The directory of each library-directory pair starts at the lower limit of the file and consists of the number of tracks specified in the ALLOC control card. The library of each library-directory pair starts on the track following the last

track used by its directory and uses the rest of the cylinder(s) specified in the ALLOC control card. The library-directory pairs thus have the same format as the system libraries on SYSRES.

The contents and organization of the private directories and libraries are the same as that for SYSRES:

1. Private core image library directory. See System Core Image Directory.
- 2.. Private core image library. See System Core Image Directory.
3. Private relocatable library directory. See System Relocatable Library Directory.
4. Private relocatable library. See System Relocatable Library.
5. Private source statement library directory. See System Source Statement Library Directory.
6. Private source statement library. See System Source Statement Library.

Private libraries are created by the copy system program CORGZ (see Librarian Organization in the DOS Librarian listed in

the Preface). The maintenance and service functions that may be performed on a private library are:

1. Maintenance
 - a. Catalog (MAINTR2, MAINTS2, \$LNKEDTC)
 - b. Delete (MAINTDR)
 - c. Rename (MAINTDR)
 - d. Condense (MAINTCN)
 - e. Set Condense Limits (MAINTCL)
 - f. Status Report (MAINTJEP)
 - g. Single Statement Update in Source Statement Library (MAINTUP)
2. Service
 - a. Core Image Library Service (CSERV)
 - b. Relocatable Library Service (RSERV)
 - c. Source Statement Library Service (SSERV)
 - d. Directory Service (DSERV)

All these maintenance and service functions are the same for private libraries as they are for system libraries. Reference can be made to a private library only if SYSCLB, SYSRLB, and/or SYSSLB are assigned for core image, relocatable, and source statement libraries, respectively. When these assignments are made, the corresponding system library cannot be changed.

Problem determination is a process or procedure for determining the cause of an error. Some DOS facilities such as I/O Error Logging, MCRR, and the DUMP option of job control, are problem determination tools. Problem determination provided by DOS consists of recommending a specific procedure to be followed when an error condition occurs. These recommendations are in the DOS Messages listed in the Preface.

PROBLEM DETERMINATION SERVICEABILITY AIDS (PDAID)

One group of programs recommended for error analysis is the Problem Determination Serviceability Aids (PDAID). PDAIDs allow users to trace one of the following events when it occurs:

- fetching or loading of other programs (F/L Trace)
- input/output activity (I/O Trace)
- supervisor calls (SVC), that is, communications between the control program and the problem program (GSVC Trace)
- QTAM input/output activity (QTAM Trace)

Tracing consists of recording pertinent data when the event occurs. This data may be used for error analysis.

In addition to the traces, the transient dump facility can be used to diagnose programming problems in the transient areas. The transient dump facility dumps the PTA, LTA, first 144 bytes of main storage, and 16 general registers, when a program check occurs.

STAND-ALONE DUMP (DUMPGEN)

A facility for problem determination is the DUMPGEN program. This program allows the

user to generate a stand-alone dump program, tailored to his requirements, for displaying the entire contents of main storage when processing under the disk operating system cannot continue. When you execute DUMPGEN, you have the option of generating either a conventional dump program or a formatting dump program. The conventional dump displays each main storage position consecutively. The formatting dump displays the supervisor tables in a more readable format after displaying main storage conventionally. Both dumps have the translating feature.

LABEL CYLINDER DISPLAY (LSERV)

You can use the LSERV label cylinder display program as a problem determination aid. LSERV displays the label cylinder of SYSRES.

Note: LSERV does not display any secured data files.

ENVIRONMENTAL RECORDING, EDITING, AND PRINTING PROGRAM (EREP)

Environmental Recording, Editing, and Printing Program (EREP) and Error Statistics by Tape Volume Utility Programs (ESTVUT, ESTVFMT) are also error analysis aids. The EREP program edits and prints data that is stored in the recorder file by the I/O error logging and MCRR functions. In addition to printing and editing the ERDS (IJSYSRC file) for the IBM System/370, EREP has the option of creating a new history tape file from the ERDS, and updating an existing history file. When creating or updating a history file, EREP clears the IJSYSRC to prevent duplication when you update the history file.

ERROR STATISTICS BY TAPE VOLUME UTILITY
PROGRAMS

ESTV Format Data Set Program (ESTVFMT)

If error statistics by tape volume are collected by the system on a disk, then ESTVFMT must be executed after the first IPL. It must also be executed whenever new label information is entered into the system for the file. The ESTVFMT program opens the ESTV data set (ESTVFLE) on the disk file, and enables it to collect the system output by putting the label information in the disk's volume table of contents.

ESTV Dump File Program (ESTVUT)

The ESTV dump file program (ESTVUT) has three routines: the ESTVUT main routine, the ESTVPR printer routine, and the ESTVMT magnetic tape routine. The program allows the operator to specify one of five options in which to process the statistics collected by the ESTV program. The options are disk to printer (with clearing or not clearing the disk file), disk to magnetic tape, tape to tape, or tape-to-printer dump.

APPENDIX A: ERROR MESSAGE CROSS-REFERENCE LIST

All error messages issued by the DOS system control programs are listed in this appendix with a reference to the PLM and phase in which the error is detected. For cause and action of each message, see DOS Messages, GC24-5074.

Message	Phase	PLM GY24-
0I00A	\$\$A\$IPL2	5086
0I01A	\$\$A\$IPL2	5086
0I10A	\$IPLRT2	5086
0I11A	\$IPLRT2	5086
0I12A	\$IPLRT2	5086
0I12I	\$IPLRT3	5086
0I13I	\$IPLRT3	5086
0I14I	\$IPLRT3	5086
0I15I	\$IPLRT3	5086
0I16A	\$IPLRT4	5086
0I17A	\$IPLRT4	5086
0I18A	\$IPLRT2	5086
0I20I	\$IPLRT4	5086
0I22I	\$IPLRT4	5086
0I23I	\$IPLRT4	5086
0I24A	\$IPLRT3	5086
0I25I	\$IPLRT4	5086
0I26I	\$\$BUFLDR	5153
0I27I	\$\$BUFLD2	5153
0I28D	\$\$BUFLD2	5153
OP08	\$\$A\$SUP1 (Disk)	5151
	\$\$ANERAI	5151
	\$\$ANERRA (Disk)	5151
	\$\$ANERRF (Tape)	5151
	\$\$ANERRG (Data Cell)	5151
	\$\$ANERRT (MICR)	5151
	\$\$ANERRU (Unit Record)	5151
	\$\$ANERRV (Unit Record)	5151
	\$\$ANERRW (MICR)	5151
	\$\$ANERRX (Paper Tape)	5151
	\$\$ANERR7 (Tape Cartridge Reader)	5151
	\$\$ANERR9 (Optical Reader)	5151
	\$\$ANERSA (3211 Printer)	5151
OP09	\$\$A\$SUP1 (Disk)	5151
	\$\$ANERAI	5151
	\$\$ANERAM (Tape)	5151
	\$\$ANERRA (Disk)	5151
	\$\$ANERRF (Tape)	5151
	\$\$ANERRG (Data Cell)	5151
	\$\$ANERRT (MICR)	5151
	\$\$ANERRU (Unit Record)	5151
	\$\$ANERRV (Unit Record)	5151
	\$\$ANERRW (MICR)	5151
	\$\$ANERRX (Paper Tape)	5151
	\$\$ANERR6 (Tape Cartridge Reader)	5151
	\$\$ANERR7 (Tape Cartridge Reader)	5151
	\$\$ANERR9 (Optical Reader)	5151
	\$\$ANERSA (3211 Printer)	5151

OP10	\$\$A\$SUP1 (Disk)	5151
	\$\$ANERAI	5151
	\$\$ANERAM (Tape)	5151
	\$\$ANERRA (Disk)	5151
	\$\$ANERRF (Tape)	5151
	\$\$ANERRG (Data Cell)	5151
	\$\$ANERRU (Unit Record)	5151
	\$\$ANERRV (Unit Record)	5151
	\$\$ANERRX (Paper Tape)	5151
	\$\$ANERR6 (Tape Cartridge Reader)	5151
	\$\$ANERR7 (Tape Cartridge Reader)	5151
	\$\$ANERSA (3211 Printer)	5151
OP11	\$\$A\$SUP1 (Disk)	5151
	\$\$ANERAJ	5151
	\$\$ANERAP (Tape)	5151
	\$\$ANERRB (Disk)	5151
	\$\$ANERRK (Data Cell)	5151
	\$\$ANERRV (Unit Record)	5151
	\$\$ANERRX (Paper Tape)	5151
	\$\$ANERR7 (Tape Cartridge Reader)	5151
	\$\$ANERSA (3211 Printer)	5151
OP12	\$\$ANERRB (Disk)	5151
	\$\$ANERRK (Data Cell)	5151
OP13	\$\$ANERRB (Disk)	5151
	\$\$ANERRK (Data Cell)	5151
OP13A	\$\$RAST10	5151
OP14	\$\$A\$SUP1 (Disk)	5151
	\$\$ANERRB (Disk)	5151
	\$\$ANERRF (Tape)	5151
	\$\$ANERRG (Data Cell)	5151
	\$\$ANERRV (Unit Record)	5151
	\$\$ANERR9 (Optical Reader)	5151
OP15	\$\$A\$SUP1 (Disk)	5151
	\$\$ANERRA (Disk)	5151
	\$\$ANERRJ (Data Cell)	5151
OP16	\$\$ANERRB (Disk)	5151
	\$\$ANERRK (Data Cell)	5151
OP17	\$\$ANERAM (Tape)	5151
	\$\$ANERRB (Disk)	5151
	\$\$ANERRG (Data Cell)	5151

OP18	\$\$A\$SUP1 (Disk)	5151	OP25	\$\$ANERRA (Disk)	5151
	\$\$ANERAI	5151		\$\$ANERR6 (Tape Cartridge Reader)	5151
	\$\$ANERAM (Tape)	5151			
	\$\$ANERRB (Disk)	5151	OP26	\$\$ANERRA (Disk)	5151
	\$\$ANERRG (Data Cell)	5151		\$\$ANERRG (Data Cell)	5151
	\$\$ANERRT (MICR)	5151			
	\$\$ANERRU (Unit Record)	5151	OP27	\$\$ANERRA (Disk)	5151
	\$\$ANERRV (Unit Record)	5151		\$\$ANERRC	5151
	\$\$ANERRW (MICR)	5151		\$\$ANERRU (Unit Record)	5151
	\$\$ANERRX (Paper Tape)	5151			
	\$\$ANERR7 (Tape Cartridge Reader)	5151	OP28	\$\$A\$SUP1 (Disk)	5151
	\$\$ANERR9 (Optical Reader)	5151		\$\$ANERAJ	5151
	\$\$ANERSA (3211 Printer)	5151		\$\$ANERRA (Disk)	5151
OP19	\$\$ANERAI	5151		\$\$ANERRF (Tape)	5151
	\$\$ANERAM (Tape)	5151		\$\$ANERRG (Data Cell)	5151
	\$\$ANERRB (Disk)	5151		\$\$ANERRT (MICR)	5151
	\$\$ANERRF (Tape)	5151		\$\$ANERRU (Unit Record)	5151
	\$\$ANERRG (Data Cell)	5151		\$\$ANERRW (MICR)	5151
	\$\$ANERRT (MICR)	5151		\$\$ANERRX (Paper Tape)	5151
	\$\$ANERRU (Unit Record)	5151		\$\$ANERR6 (Tape Cartridge Reader)	5151
	\$\$ANERRV (Unit Record)	5151		\$\$ANERR9 (Optical Reader)	5151
	\$\$ANERRW (MICR)	5151		\$\$ANERSA (3211 Printer)	5151
	\$\$ANERRX (Paper Tape)	5151	OP29	\$\$ANERAM (Tape)	5151
	\$\$ANERR6 (Tape Cartridge Reader)	5151	OP30	\$\$ANERAM (Tape)	5151
	\$\$ANERR7 (Tape Cartridge Reader)	5151	OP31	\$\$ANERRA (Disk)	5151
	\$\$ANERR9 (Optical Reader)	5151		\$\$ANERRD (Tape)	5151
	\$\$ANERSA (3211 Printer)	5151		\$\$ANERRF (Tape)	5151
OP20	\$\$A\$SUP1 (Disk)	5151		\$\$ANERR6 (Tape Cartridge Reader)	5151
	\$\$ANERAI	5151	OP32	\$\$ANERAM (Tape)	5151
	\$\$ANERAJ	5151	OP33	\$\$ANERRV (Unit Record)	5151
	\$\$ANERAK (Tape)	5151		\$\$ANERSA (3211 Printer)	5151
	\$\$ANERAL (Tape)	5151		\$\$ANERRW (MICR)	5151
	\$\$ANERAM (Tape)	5151	OP34	\$\$ANERR9 (Optical Reader)	5151
	\$\$ANERAN (Tape)	5151	OP35	\$\$ANERR9 (Optical Reader)	5151
	\$\$ANERAQ (Tape)	5151	OP36	\$\$A\$SUP1 (Disk)	5151
	\$\$ANERRE (Tape)	5151		\$\$ANERRA (Disk)	5151
	\$\$ANERRF (Tape)	5151		\$\$ANERRJ (Data Cell)	5151
	\$\$ANERRL (Tape)	5151	OP37	\$\$ANERRT (MICR)	5151
	\$\$ANERRH (Data Cell)	5151		\$\$ANERRW (MICR)	5151
	\$\$ANERRI (Data Cell)	5151	OP38	\$\$ANERR9 (Optical Reader)	5151
	\$\$ANERRJ (Data Cell)	5151	OP39	\$\$ANERR7 (Tape Cartridge Reader)	5151
	\$\$ANERR6 (Tape Cartridge Reader)	5151			
	\$\$ANERR8 (Tape Cartridge Reader)	5151	OP40	\$\$ANERAI	5151
	\$\$ANERSA (3211 Printer)	5151	OP41	\$\$ANERSA (3211 Printer)	5151
OP21	\$\$A\$SUP1 (Disk)	5151	OP60D	\$\$ANERRY	5151
	\$\$ANERRA (Disk)	5151			
	\$\$ANERRJ (Data Cell)	5151	OP70I	\$\$BEOJ2	5152
OP22	\$\$ANERRG (Data Cell)	5151	OP71I	\$\$BEOJ2	5152
OP23	\$\$ANERRJ (Data Cell)	5151	OP72I	\$\$BEOJ2	5152
OP24	\$\$ANERRA (Disk)	5151	OP73I	\$\$BEOJ2A	5152
	\$\$ANERR6 (Tape Cartridge Reader)	5151	OP74I	\$\$BEOJ2A	5152
			OP75I	\$\$BEOJ2	5152
			OP76I	\$\$BEOJ2	5152

OP77I	\$\$BEOJ2	5152	OT16I	\$\$RAST03	5151
OP78I	\$\$BEOJ2A	5152		\$\$RAST11	5151
OP79I	\$\$BEOJ2A	5152	OT17I	\$\$RAST03	5151
				\$\$RAST11	5151
OP81I	\$\$BEOJ2A	5152	OT18I	\$\$RAST01	5151
OP82I	\$\$BEOJ2A	5152		\$\$RAST11	5151
OP83A	\$\$BEOJ2	5152	OT19I	\$\$RAST09	5151
OP84I	\$\$BEOJ2A	5152			
OP85I	\$\$BEOJ2A	5152			
OP86I	\$\$BEOJ4	5152	OT20I	\$\$RAST09	5151
OS00I	\$\$BPCHK	5152			
	\$\$BILSVC	5152	1A0nD	\$\$JOBCTLD	5086
OS01I	\$\$BEOJ2	5152	1A00D	\$\$BATTNI	5152
OS02I	\$\$BEOJ2	5152			
OS03I	\$\$BPCHK	5152			
OS04I	\$\$BILSVC	5152	1A1nD	\$\$JOBCTLD	5086
OS05I	\$\$BILSVC	5152	1A10D	\$\$BATTNI	5152
OS06I	\$\$BEOJ1	5152		\$\$BATTNP	5152
OS07I	\$\$BPSW	5152			
OS08I	\$\$BEOJ	5152			
OS09I	\$\$BEOJ1	5152	1A2nD	\$\$JOBCTLD	5086
			1A20D	\$\$BATTNI	5152
				\$\$BATTNM	5152
OS10I	\$\$BTERM	5152		\$\$BATTNP	5152
OS11I	\$\$BEOJ1	5152		\$\$JOBCTLG	5086
OS12I	\$\$BEOJ2A	5152		\$\$JOBCTLJ	5086
OS13I	\$\$BEOJ2A	5152			
OS14I	\$\$BEOJ2A	5152			
OT00I	\$\$ANERAG	5151	1A3nD	\$\$JOBCTLD	5086
	\$\$RAST01	5151	1A30D	\$\$BATTNI	5152
	\$\$RAST11	5151			
OT01I	\$\$ANERAF	5151	1A4nD	\$\$JOBCTLD	5086
OT02I	\$\$ANERAF	5151		\$\$JOBCTLF	5086
OT03I	\$\$ANERAF	5151	1A40D	\$\$BATTNI	5152
	\$\$RAST01	5151		\$\$BATTNK	5152
	\$\$RAST11	5151		\$\$BATTNM	5152
OT04I	\$\$ANERAG	5151		\$\$JOBCTLJ	5086
				\$\$JOBCTLK	5086
OT05I	\$\$RAST01	5151			
	\$\$RAST11	5151	1A5nD	\$\$JOBCTLD	5086
OT06I	\$\$RAST03	5151		\$\$JOBCTLF	5086
	\$\$RAST11	5151	1A50D	\$\$BATTNI	5152
OT07I	\$\$RAST03	5151		\$\$JOBCTLJ	5086
	\$\$RAST11	5151			
OT08I	\$\$RAST03	5151	1A6nD	\$\$JOBCTLD	5086
	\$\$RAST11	5151		\$\$JOBCTLF	5086
OT09I	\$\$RAST03	5151	1A60D	\$\$BATTNI	5152
	\$\$RAST11	5151			
OT10I	\$\$RAST04	5151	1A7nD	\$\$JOBCTLD	5086
	\$\$RAST05	5151		\$\$JOBCTLF	5086
	\$\$RAST07	5151	1A70D	\$\$BATTNI	5152
	\$\$RAST10	5151		\$\$JOBCTLJ	5086
OT11I	\$\$RAST01	5151			
OT12I	\$\$RAST04	5151	1A9nD	\$\$JOBCTLD	5086
	\$\$RAST05	5151	1A90D	\$\$JOBCTLF	5086
	\$\$RAST07	5151			
	\$\$RAST10	5151	1B01A	SYSBUFLD	5153
OT13A	\$\$RAST04	5151	1B02A	SYSBUFLD	5153
	\$\$RAST05	5151	1B03I	SYSBUFLD	5153
	\$\$RAST10	5151	1B04I	SYSBUFLD	5153
OT14I	\$\$RAST03	5151	1B05I	SYSBUFLD	5153
	\$\$RAST11	5151	1B06I	SYSBUFLD	5153
OT15I	\$\$RAST09	5151	1C00A	\$\$JOBCTLA	5086

1C10A	\$JOBCTLA	5086	1S0nD	\$\$BATTNA	5152
	\$JOBCTLG	5086		\$\$BATTNB	5152
	\$JOBCTLJ	5086		\$\$BATTNC	5152
1C20D	\$\$BATTNH	5152		\$\$BATTNE	5152
1C30A	\$JOBCTLJ	5086		\$\$BATTNG	5152
1C3nI	\$JOBCTLG	5086		\$\$BATTNI	5152
1C40I	\$\$BATTNB	5152		\$\$BATTNJ	5152
1C50I	\$\$BATTNB	5152		\$\$BATTNK	5152
1C60D	\$\$BATTNN	5152		\$\$BATTNL	5152
1C70D	\$JOBCTLA	5086		\$\$BATTNM	5152
1C80D	\$JOBCTLA	5086		\$\$BATTNN	5152
1C90A	\$MAINEOJ	5079		\$\$BATTNO	5152
				\$\$BATTNP	5152
1I00A	\$JOBCTLA	5086	1S00A	\$JOBCTLA through	
1I30D	\$\$BATTNC	5152		\$JOBCTLK	5086
1I32D	\$\$ANERR0	5151	1S00D	\$JOBCTLG	5086
1I40D	\$\$ANERR0	5151	1S01D	\$\$ANERR0	5151
1I41D	\$\$BATTNT	5152	1S02D	\$\$ANERR0	5151
	\$\$BATTNU	5152	1S03I	\$JOBCTLJ	5086
1I42D	\$\$BATTNT	5152			
1I43D	\$\$BATTNV	5152	1S10D	\$\$BATTNK	5152
	\$\$BATTNW	5152		\$\$BATTNL	5152
1I44I	\$\$BATTNX	5152		\$\$BATTNM	5152
1I45D	\$\$BATTNT	5152		\$\$BATTNO	5152
1I46D	\$\$BATTNW	5152		\$JOBCTLG	5086
				\$JOBCTLJ	5086
				\$JOBCTLK	5086
1I50I	\$JOBCTLA	5086			
1I60A	\$\$BATTNA	5152	2100I	\$LNKEDT2	5080
1I70I	\$JOBCTLA	5086	2101I	\$LNKEDT4	5080
			2102I	\$LNKEDT	5080
				\$LNKEDT4	5080
1I80I	\$\$BTERM	5152			
1I83A	\$JOBCTLM	5086	2110I	\$LNKEDT4	5080
1I84A	\$JOBCTLM	5086	2111I	\$LNKEDT4	5080
1I85A	\$JOBCTLM	5086	2112I	\$LNKEDT	5080
1I86A	\$JOBCTLM	5086		\$LNKEDT4	5080
1I87A	\$JOBCTLM	5086	2113I	\$LNKEDT2	5080
1I88I	\$JOBCTLJ	5086	2114I	\$LNKEDT4	5080
1I89I	\$JOBCTLM	5086	2115I	\$LNKEDT4	5080
			2116I	\$LNKEDT4	5080
1I90D	\$JOBCTLM	5086	2120I	\$LNKEDT6	5080
1I91D	\$JOBCTLM	5086	2121I	\$LNKEDT6	5080
1I92D	\$JOBCTLM	5086	2122I	\$LNKEDT6	5080
1I93I	\$JOBCTLM	5086	2123I	\$LNKEDT6	5080
			2124I	\$LNKEDT6	5080
			2125I	\$LNKEDT4	5080
1L00D	\$\$BATTNL	5152			
	\$\$BATTNC	5152	2130I	\$LNKEDT6	5080
	\$JOBCTLK	5086	2131I	\$LNKEDT6	5080
1L10D	\$\$BATTNK	5152	2132I	\$LNKEDT6	5080
	\$\$BATTNL	5152	2133I	\$LNKEDT4	5080
	\$\$BATTNM	5152	2135I	\$LNKEDT	5080
	\$\$BATTNC	5152	2136I	\$LNKEDT	5080
	\$JOBCTLG	5086			
	\$JOBCTLK	5086	2140I	\$LNKEDT0	5080
			2141I	\$LNKEDT0	5080
1P00D	\$\$BATTNF	5152	2142I	\$LNKEDT0	5080
	\$JOBCTLJ	5086	2143I	\$LNKEDT0	5080
1P10D	\$\$BATTNG	5152	2144I	\$LNKEDT	5080
			2145I	\$LNKEDT0	5080
			2146I	\$LNKEDT0	5080
			2147I	\$LNKEDT2	5080
			2150I	\$LNKEDT	5080
				\$LNKEDT2	5080

2151I	\$LNKEDT2	5080	3M21I	CORGZ	5079
2155I	\$LNKEDT2	5080		CORGZ1	5079
2156I	\$LNKEDT2	5080		CORGZ3	5079
2158I	\$LNKEDT2	5080		CORGZ4	5079
				CORGZ5	5079
2170I	\$LNKEDT2	5080		CORGZ6	5079
				CORGZ7	5079
2181I	\$LNKEDT6	5080		CORGZ8	5079
2182I	\$LNKEDT6	5080		CSERV	5079
2183I	\$LNKEDT	5080		DSERV1	5079
2184I	\$LNKEDT	5080		MAINTA	5079
2185I	\$LNKEDT8	5080		MAINTCL	5079
				MAINTCN	5079
2191I	\$LNKEDT	5080		MAINTDR	5079
	\$LNKEDT2	5080		MAINTR2	5079
2192I	\$LNKEDT6	5080		RSERV	5079
2193I	\$LNKEDT	5080		SSERV	5079
	\$LNKEDT6	5080	3M22I	\$LNKEDTC	5079
2194I	\$LNKEDT	5080	3M23I	MAINTS2	5079
2195I	\$LNKEDT4	5080	3M24I	MAINTS2	5079
2197I	\$LNKEDT	5080	3M25I	MAINTS2	5079
2199I	\$LNKEDT8	5080	3M26I	MAINTS2	5079
			3M27I	MAINTR2	5079
3C30I	CORGZ	5079		MAINTS2	5079
	CORGZ1	5079	3M28I	MAINTS2	5079
3C66I	CORGZ	5079	3M33I	CORGZ1	5079
	CORGZ4	5079		CORGZ3	5079
	CORGZ5	5079		CSERV	5079
	CORGZ6	5079		DSERV1	5079
	CORGZ7	5079		MAINTDR	5079
3C67I	CORGZ	5079		MAINTUP	5079
	CORGZ4	5079		RSERV	5079
	CORGZ5	5079		SSERV	5079
	CORGZ6	5079	3M34I	MAINT	5079
	CORGZ7	5079	3M35I	DSERV1	5079
3E10I	EREPEDIT	5153			
	EREPHIST	5153			
3E11D	EREP	5153	3M43I	CORGZ1	5079
3E12D	EREP	5153		CORGZ4	5079
3E13I	EREPHIST	5153		CORGZ5	5079
3E14A	EREP	5153		CSERV	5079
3E15A	EREPHIST	5153		DSERV1	5079
3E16A	EREP	5153		MAINT	5079
3E18I	EREPHIST	5153		MAINTCL	5079
				MAINTDR	5079
3E20I	EREP2715	5153		MAINTR2	5079
3E22I	EREPEDIT	5153		MAINTS2	5079
3E25I	EREP	5153		MAINTUP	5079
	EREPHIST	5153		RSERV	5079
3E26I	EREP	5153		SSERV	5079
3E27I	EREP	5153			
3E28I	EREP	5153			
3E29I	EREP	5153			
3E30I	EREPASSM	5153			
3E31A	EREPHIST	5153			
3M10I	CORGZ	5079			
	CORGZ1	5079			
	CSERV	5079			
	DSERV1	5079			
	MAINT	5079			
	MAINTA	5079			
	RSERV	5079			
	SSERV	5079			
3M11I	MAINTR2	5079			

3M44I	CORGZ 6	5079	4C24A	PDAIDFTP	5153
	MAINTCN	5079		PDAIDFTT	5153
3M45I	DSERV1	5079		PDAIDGTP	5153
				PDAIDGTT	5153
3M52I	CORGZ 3	5079		PDAIDITP	5153
	MAINTR2	5079		PDAIDITT	5153
	MAINTS2	5079		PDAIDQTT	5153
	MAINTUP	5079		PDAIDTDP	5153
	\$LNKEDTC	5079		PDAIDTDT	5153
3M53I	CORGZ 3	5079			
	MAINTR2	5079			
	MAINTS2	5079	4C25I	PDAID	5153
	MAINTUP	5079	4C26I	PDLIST	5153
3M54I	MAINTDR	5079	4C27D	PDAID	5153
	MAINTUP	5079	4C28D	PDAID	5153
3M55I	MAINTR2	5079			
			4C40A	DUMPGEN	5153
3M62I	CORGZ 7	5079	4C41A	DUMPGEN	5153
	MAINTA	5079	4C42A	DUMPGEN	5153
3M63I	CORGZ 7	5079	4C43A	DUMPGEN	5153
	MAINTA	5079	4C44A	DUMPGEN	5153
3M64I	CORGZ 1	5079	4C45A	DUMPGEN	5153
	MAINTA	5079	4C46A	DUMPGEN	5153
3M65I	CORGZ	5079			
	CORGZ 1	5079			
	CORGZ 7	5079	4E00I	\$\$BESTVB	5152
	MAINTA	5079	4E01I	\$\$BESTVC	5152
3M66I	CORGZ 7	5079	4E02I	\$\$BESTVC	5152
3M67I	CORGZ 7	5079	4E03I	\$\$BESTVE	5152
3M68I	MAINTA	5079	4E04I	\$\$BESTVC	5152
	MAINTCN	5079	4E05I	\$\$BESTVF	5152
3M69I	MAINTCN	5079	4E06I	\$\$BESTVF	5152
			4E10I	\$\$ANERAR	5151
3M70I	MAINTA	5079			
	MAINTCN	5079			
3M75I	MAINTCN	5079	4R00I	ESTVFMT	5153
			4R01I	ESTVUT	5153
3M80I	MAINTA	5079	4R02A	ESTVUT	5153
	MAINTCN	5079	4R03I	ESTVUT	5153
	MAINTEJP	5079	4R04A	ESTVUT	5153
3M81I	MAINTCN	5079	4R05I	ESTVUT	5153
			4R06I	ESTVUT	5153
3U10I	MAINTUP	5079	4R07I	ESTVUT	5153
3U11I	MAINTUP	5079	4R08A	ESTVMFT	5153
			4R09D	ESTVMT	5153
3U20I	MAINTUP	5079	4R09I	ESTVFMT	5153
3U21I	MAINTUP	5079			
3U30I	MAINTUP	5079			
3U31I	MAINTUP	5079			
4C10D	PDAID	5153			
4C11D	PDAID	5153			
4C12D	PDAID	5153			
4C13D	PDAID	5153			
4C14D	PDAID	5153			
4C15D	PDAID	5153			
4C16D	PDAID	5153			
4C17D	PDAID	5153			
4C18I	PDAID	5153			
4C19I	PDAID	5153			
4C20D	PDAID	5153			
4C21A	PDAID	5153			
4C22A	PDAID	5153			
4C23D	PDAID	5153			

APPENDIX B: MICROFICHE CROSS-REFERENCE INDEX

The index gives the relationship of core-image phase names, relocatable module names, microfiche labels, and microfiche identification numbers to each other.

An asterisk indicates the microfiche label. If the microfiche label differs from both the phase and the module name, it is so indicated in parentheses.

When a phase or module takes up more than one microfiche card, the identification number of only the first card is shown.

The index includes all the macro names and identification numbers. The position of each macro on the microfiche card is further identified by rows A to E. The rows are not indicated for macros that use more than one microfiche card.

PROGRAM TYPE AND NUMBER

System Control: 360N-CL-453

Logical IOCS:

CDMOD: 360N-CL-453
CPMOD: 360N-CL-453
DAMOD: 360N-IO-454
DIMOD: 360N-CL-457
DTFCN: 360N-CL-453
ISMOD: 360N-IO-457
MRMOD: 360N-IO-477
MTMOD: 360N-IO-456
ORMOD: 360N-IO-478
PRMOD: 360N-CL-453
PTMOD: 360N-IO-458
SDMOD: 360N-IO-455

Telecommunications Access Methods:

BTAM: 360N-CQ-469

QTAM: 360N-CQ-470

Assembler D: 360N-AS-465
Assembler F: 360N-AS-466

Compiler I/O Modules: 360N-IO-476
COBOL D: 360N-CB-452
COBOL Language Conversion Program:
360N-CV-489
COBOL F, American National Standard:
360N-CB-482
COBOL DASD Macros: 360N-CB-468

FORTRAN IV (Basic): 360N-FO-451
FORTRAN IV: 360N-FO-479
FORTRAN IV Library Subroutines:
360N-LM-480

PL/I (D): 360N-PL-464

Report Program Generator (RPG):
360N-RG-460

OLTEP: 360N-DN-481

Magnetic Ink Character Reader (MICR ERP):
360N-IO-477

Optical Character Reader (ORERP) :
360N-IO-478

Index-Sequential File Management System:
360N-CL-457

Sort/Merge (Disk): 360N-SM-450
Sort/Merge (Disk/Tape): 360N-SM-483
Sort/Merge (Tape): 360N-SM-400

Utilities:

Group 1--Unit Record and Disk
360N-UT-461
Group 2--Tape 360N-UT-462
Group 3--Data Cell 360N-UT-463

MPS 360N-UT-471

Vocabulary File 360N-UT-472

Emulator Mod 30: 360N-EU-484
Emulator Mod 40: 360N-EU-485
Emulator System/370: 360N-EU-490

Autotest: 360N-PT-459

Distribution Program: 360P-UT-208

SYSTEM CONTROL

Core Image Phase Name	Relocatable Module Name	Card ID		
			\$\$ANERSB*	None CTL.043.60
			\$\$ANERSC*	None CTL.043.70
			\$\$BATTNA*	None CTL.044.00
			\$\$BATTNB	None CTL.044.00
			(\$\$BATTNA)	
			\$\$BATTNC	None CTL.044.00
			(\$\$BATTNA)	
\$\$A\$IPL1*	None	CTL.001.00	\$\$BATTND	None CTL.044.00
\$\$A\$IPL2	None	CTL.001.00	(\$\$BATTNA)	
(\$\$A\$IPL1)			\$\$BATTNE	None CTL.044.00
			(\$\$BATTNA)	
\$\$ANERAA*	None	CTL.002.00	\$\$BATTNF	None CTL.044.00
\$\$ANERAB*	None	CTL.003.00	(\$\$BATTNA)	
\$\$ANERAC*	None	CTL.004.00	\$\$BATTNG	None CTL.044.00
\$\$ANERAD*	None	CTL.005.00	(\$\$BATTNA)	
\$\$ANERAE*	None	CTL.006.00	\$\$BATTNH	None CTL.044.00
\$\$ANERAF*	None	CTL.007.00	(\$\$BATTNA)	
\$\$ANERAG*	None	CTL.008.00	\$\$BATTNI*	None CTL.045.00
\$\$ANERAI*	None	CTL.009.00	\$\$BATTNJ*	None CTL.046.00
\$\$ANERAJ*	None	CTL.010.00	\$\$BATTNK*	None CTL.047.00
\$\$ANERAK*	None	CTL.011.00	\$\$BATTNL*	None CTL.048.00
\$\$ANERAL*	None	CTL.012.00	\$\$BATTNM*	None CTL.049.00
\$\$ANERAM*	None	CTL.013.00	\$\$BATTNN*	None CTL.050.00
\$\$ANERAN*	None	CTL.014.00	\$\$BATTNO*	None CTL.051.00
\$\$ANERAP*	None	CTL.015.00	\$\$BATTNP*	None CTL.052.00
\$\$ANERAQ*	None	CTL.016.00	\$\$BATTNQ*	None CTL.052.50
\$\$ANERAR*	None	CTL.017.00	\$\$BATTNR*	None CTL.052.60
\$\$ANERAS*	None	CTL.018.00	\$\$BATTNS*	None CTL.052.70
\$\$ANERRA*	None	CTL.019.00	\$\$BATTNT*	None CTL.052.72
\$\$ANERRB	None	CTL.019.00	\$\$BATTNU	None CTL.052.72
(\$\$ANERRA)			(\$\$BATTNT)	
\$\$ANERRC	None	CTL.019.00	\$\$BATTNV*	None CTL.052.74
(\$\$ANERRA)			\$\$BATTNW	None CTL.052.74
\$\$ANERRD*	None	CTL.020.00	(\$\$BATTNV)	
\$\$ANERRE*	None	CTL.021.00	\$\$BATTNX	None CTL.052.74
\$\$ANERRF*	None	CTL.022.00	(\$\$BATTNV)	
\$\$ANERRG*	None	CTL.023.00	\$\$BCCHHR*	None CTL.052.80
\$\$ANERRH*	None	CTL.024.00	\$\$BCCPT1*	None CTL.053.00
\$\$ANERRI*	None	CTL.025.00	\$\$BCEOV1*	None CTL.054.00
\$\$ANERRJ*	None	CTL.026.00	\$\$BCHKPD*	None CTL.055.00
\$\$ANERRK*	None	CTL.027.00	\$\$BCHKPE*	None CTL.056.00
\$\$ANERRL*	None	CTL.028.00	\$\$BCHKPF*	None CTL.057.00
\$\$ANERRM*	None	CTL.029.00	\$\$BCHKPT*	None CTL.058.00
\$\$ANERRN*	None	CTL.030.00	\$\$BCHKP2*	None CTL.059.00
\$\$ANERRO*	None	CTL.031.00	\$\$BCIS0A*	None CTL.060.00
\$\$ANERRP*	None	CTL.032.00	\$\$BCLOSE*	None CTL.061.00
\$\$ANERRQ*	None	CTL.033.00	\$\$BCLOSP*	None CTL.062.00
\$\$ANERRR*	None	CTL.034.00	\$\$BCLOS2*	None CTL.063.00
\$\$ANERRS*	None	CTL.035.00	\$\$BCMT01*	None CTL.064.00
\$\$ANERRU*	None	CTL.036.00	\$\$BCMT02*	None CTL.065.00
\$\$ANERRV*	None	CTL.037.00	\$\$BCMT03*	None CTL.066.00
\$\$ANERRX*	None	CTL.038.00	\$\$BCMT04*	None CTL.067.00
\$\$ANERRY*	None	CTL.039.00	\$\$BCMT05*	None CTL.068.00
\$\$ANERRZ	None	CTL.039.00	\$\$BCMT06*	None CTL.069.00
(\$\$ANERRY)			\$\$BCMT07*	None CTL.070.00
\$\$ANERRO	None	CTL.039.00	\$\$BDRSTR*	None CTL.071.00
(\$\$ANERRY)			\$\$BDUMP*	IJBDMPS CTL.072.00
\$\$ANERR1*	None	CTL.040.00	\$\$BDUMP*	IJBDMPT CTL.072.01
\$\$ANERR6*	None	CTL.041.00	\$\$BDUMPB*	IJBDMPBS CTL.073.00
\$\$ANERR7*	None	CTL.042.00	\$\$BDUMPB*	IJBDMPBT CTL.073.01
\$\$ANERR8*	None	CTL.043.00	\$\$BDUMPD*	IJBMPDS CTL.074.00
\$\$ANERSA*	None	CTL.043.50	\$\$BDUMPD*	IJBMPDT CTL.074.01
			\$\$BDUMPF*	IJBMPFS CTL.075.00
			\$\$BEOJ*	None CTL.076.00
			\$\$BEOJ1*	None CTL.077.00

*Used as the microfiche card label.

\$\$BEOJ2*	None	CTL.078.00	\$\$BOMTOM*	None	CTL.133.00
\$\$BEOJ2A*	None	CTL.079.00	\$\$BOMTOW*	None	CTL.134.00
\$\$BEOJ3*	None	CTL.080.00	\$\$BOMT01*	None	CTL.135.00
\$\$BEOJ3A*	None	CTL.080.50	\$\$BOMT02*	None	CTL.136.00
\$\$BEOJ4*	None	CTL.081.00	\$\$BOMT03*	None	CTL.137.00
\$\$BEOJ5*	None	CTL.082.00	\$\$BOMT04*	None	CTL.138.00
\$\$BERRTN*	None	CTL.083.00	\$\$BOMT05*	None	CTL.139.00
\$\$BERPTP*	None	CTL.084.00	\$\$BOMT06*	None	CTL.140.00
\$\$BESTVA*	None	CTL.085.00	\$\$BOMT07*	None	CTL.140.50
\$\$BESTVB*	None	CTL.086.00	\$\$BONVOL*	None	CTL.141.00
\$\$BESTVC*	None	CTL.087.00	\$\$BOPEN*	None	CTL.142.00
\$\$BESTVD*	None	CTL.088.00	\$\$BOPENC*	None	CTL.143.00
\$\$BESTVE*	None	CTL.089.00	\$\$BOPENR*	None	CTL.144.00
\$\$BESTVF*	None	CTL.089.50	\$\$BOPEN2*	None	CTL.145.00
\$\$BFCB*	None	CTL.089.70	\$\$BOPIGN*	None	CTL.146.00
\$\$BILSVC*	None	CTL.090.00	\$\$BOPNLB*	None	CTL.147.00
\$\$BJCOPT*	None	CTL.091.00	\$\$BOPNR2*	None	CTL.148.00
\$\$BJCOP1*	None	CTL.092.00	\$\$BOSDC1*	None	CTL.149.00
\$\$BLSTIO*	None	CTL.093.00	\$\$BOSDC2*	None	CTL.150.00
\$\$BMSGWR*	None	CTL.094.00	\$\$BOSDEV*	None	CTL.151.00
\$\$BOCPES*	None	CTL.094.50	\$\$BOSDI1	None	CTL.152.00
\$\$BOCPM1*	None	CTL.095.00	\$\$BOSDI2*	None	CTL.153.00
\$\$BOCPM2*	None	CTL.096.00	\$\$BOSDI3*	None	CTL.154.00
\$\$BOCPT1*	None	CTL.097.00	\$\$BOSDI4*	None	CTL.154.50
\$\$BOCPT2*	None	CTL.098.00	\$\$BOSDO1*	None	CTL.155.00
\$\$BOCPT3*	None	CTL.099.00	\$\$BOSDO2*	None	CTL.156.00
\$\$BOCPT4*	None	CTL.099.50	\$\$BOSDO3*	None	CTL.157.00
\$\$BOCP01*	None	CTL.100.00	\$\$BOSDO4*	None	CTL.158.00
\$\$BOCP02*	None	CTL.101.00	\$\$BOSDO5*	None	CTL.159.00
\$\$BOCP11*	None	CTL.102.00	\$\$BOSDO6*	None	CTL.160.00
\$\$BOCP12*	None	CTL.103.00	\$\$BOSDO7*	None	CTL.161.00
\$\$BODACL*	None	CTL.104.00	\$\$BOSDO8*	None	CTL.162.00
\$\$BODAI1*	None	CTL.105.00	\$\$BOSDR*	None	CTL.163.00
\$\$BODAIN*	None	CTL.106.00	\$\$BOSDW1*	None	CTL.164.00
\$\$BODAO1*	None	CTL.107.00	\$\$BOSDW2*	None	CTL.165.00
\$\$BODAO2*	None	CTL.108.00	\$\$BOSDW3*	None	CTL.166.00
\$\$BODAO3*	None	CTL.109.00	\$\$BOSD00*	None	CTL.167.00
\$\$BODAO4*	None	CTL.110.00	\$\$BOSD01*	None	CTL.168.00
\$\$BODAU1*	None	CTL.111.00	\$\$BOSIGN*	None	CTL.169.00
\$\$BODQUE*	None	CTL.112.00	\$\$BOUR01*	None	CTL.170.00
\$\$BODSMW*	None	CTL.112.50	\$\$BOVDMP*	None	CTL.171.00
\$\$BODSPV*	None	CTL.113.00	\$\$BOWDMP*	None	CTL.171.50
\$\$BODSPW*	None	CTL.114.00	\$\$BPCHK*	None	CTL.172.00
\$\$BOFLPT*	None	CTL.115.00	\$\$BPDAID*	None	CTL.172.50
\$\$BOIS01*	None	CTL.116.00	\$\$BPDUMP*	IJBPDMP5	CTL.173.00
\$\$BOIS02*	None	CTL.117.00	\$\$BPDUMP*	IJBPDMP7	CTL.173.01
\$\$BOIS03*	None	CTL.118.00	\$\$BPDUM1*	IJBPDUM5	CTL.174.00
\$\$BOIS04*	None	CTL.119.00	\$\$BPSW*	None	CTL.175.00
\$\$BOIS05*	None	CTL.120.00	\$\$BRELS*	None	CTL.176.00
\$\$BOIS06*	None	CTL.121.00	\$\$BRMSG1*	None	CTL.177.00
\$\$BOIS07*	None	CTL.122.00	\$\$BRMSG2*	None	CTL.178.00
\$\$BOIS08*	None	CTL.123.00	\$\$BRSTRB*	None	CTL.179.00
\$\$BOIS09*	None	CTL.124.00	\$\$BRSTRT*	None	CTL.180.00
\$\$BOIS10*	None	CTL.125.00	\$\$BRSTR2*	None	CTL.181.00
\$\$BOMSG1*	None	CTL.126.00	\$\$BRSTR3*	None	CTL.182.00
\$\$BOMSG2*	None	CTL.127.00	\$\$BRSTR4*	None	CTL.183.00
\$\$BOMSG3*	None	CTL.128.00	\$\$BSDRUP*	None	CTL.185.00
\$\$BOMSG4*	None	CTL.129.00	\$\$BSYSWR*	None	CTL.186.00
\$\$BOMSG5*	None	CTL.130.00	\$\$BTERM*	None	CTL.187.00
\$\$BOMSG6*	None	CTL.131.00	\$\$BUCB*	None	CTL.187.10
\$\$BOMSG7*	None	CTL.131.50	\$\$BUFLDR*	None	CTL.187.20
\$\$BOMTES*	None	CTL.132.00	\$\$BUFLD2*	None	CTL.187.20

*Used as the microfiche card label.

\$\$RAST00* IILVRAS00 CTL.257.00

\$\$RAST01*	ILVRAS01	CTL.258.00	EREPCLR	IJBECRL*	CTL.192.00
\$\$RAST02*	ILVRAS02	CTL.259.00	EREPEDIT	IJBEDIT*	CTL.192.50
\$\$RAST03*	ILVRAS03	CTL.260.00	EREPHIST	IJBHIST*	CTL.192.75
\$\$RAST04*	ILVRAS04	CTL.261.00	EREPIFA	IJBEIFA*	CTL.192.80
\$\$RAST05*	ILVRAS05	CTL.262.00	EREPIPL	IJBEIPL*	CTL.192.90
\$\$RAST07*	ILVRAS07	CTL.264.00	EREPILOG1	IJBEOG1*	CTL.229.00
\$\$RAST09*	ILVRAS09	CTL.266.00	EREPILOG2	IJBEOG2*	CTL.230.00
\$\$RAST10*	ILVRAS10	CTL.267.00	EREPILOG3	IJBEOG3*	CTL.231.00
\$\$RAST11*	ILVRAS11	CTL.268.00	EREPILOG4	IJBEOG4*	CTL.232.00
			EREPILOG5	IJBEOG5*	CTL.232.50
\$IPLRT2	IJBIPL*	CTL.201.00	EREPILOG6	IJBEOG6*	CTL.232.55
\$IPLRT3	IJBIPL3	CTL.201.00	EREPILOG7	IJBEOG7*	CTL.232.60
	(IJBIPL)		EREPILOG8	IJBEOG8*	CTL.232.65
\$IPLRT4	IJBIPL4	CTL.201.00	EREPILOG9	IJBEOG9*	CTL.232.70
	(IJBIPL)		EREPLST	IJBELST*	CTL.232.75
\$JOBACCT	\$JOBACCT*	CTL.187.25	EREPMC30	IJBEMC30*	CTL.234.00
			EREPMC45	IJBEMC45*	CTL.235.50
			EREPMC40	IJBEMC40*	CTL.235.00
\$JOBCTLA	IJBJC1*	CTL.202.00	EREPMC50	IJBEMC50*	CTL.236.00
\$JOBCTLD	IJBJC2*	CTL.203.00	EREPMC55	IJBEMC55*	CTL.236.50
\$JOBCTLF	IJBJC5*	CTL.206.00	EREPMPX	IJBEMPX*	CTL.236.70
\$JOBCTLG	IJBJC3*	CTL.204.00	EREPOBR	IJBROBR*	CTL.194.00
\$JOBCTLJ	IJBJC4*	CTL.205.00	EREPSDR	IJBERSDR*	CTL.195.00
\$JOBCTLK	IJBJC6*	CTL.207.00	EREPSSEL	IJBESSEL*	CTL.195.50
\$JOBCTLM	IJBJC7*	CTL.208.00	EREP2715	IJBE2715*	CTL.200.00
\$JOBCTLN	IJBJC8*	CTL.208.50	ESTVFM	IJBESTFM*	CTL.196.00
			ESTVMT	IJBESTMT*	CTL.197.00
\$LNKEDT	IJBLE1*	CTL.228.00	ESTVPR	IJBESTPR*	CTL.198.00
\$LNKEDTA	IJBLE1*	CTL.228.01	ESTVUT	IJBESTUT*	CTL.199.00
\$LNKEDTC	IJBLBI*	CTL.216.00			
\$LNKEDT0	IJBLE1*	CTL.228.02	LSERV	IJBLSERV*	CTL.228.50
\$LNKEDT2	IJBLE1*	CTL.228.03			
\$LNKEDT4	IJBLE1*	CTL.228.03	MAINT	IJBMIN*	CTL.239.00
\$LNKEDT6	IJBLE1*	CTL.228.03	MAINTA	IJBLBL*	CTL.219.00
\$LNKEDT8	IJBLE1*	CTL.228.03	MAINTCL	IJBLBM*	CTL.220.00
			MAINTCN	IJBLBG*	CTL.214.00
\$MAINEOJ	IJBLBH*	CTL.215.00	MAINTDR	IJBLBD*	CTL.211.00
			MAINTEJP	IJBLBZ*	CTL.227.00
			MAINTR2	IJBLBE*	CTL.212.00
CORGZ	IJBLBJ*	CTL.217.00	MAINTS2	IJBLBF*	CTL.213.00
CORGZ1	IJBLBS*	CTL.223.00	MAINTUP	IJBLBQ*	CTL.222.00
CORGZ2	IJBLBK*	CTL.218.00			
CORGZ3	IJBLBT*	CTL.224.00	PDAID	IJBPAID*	CTL.241.50
CORGZ4	IJBLBU*	CTL.225.00	PDAIDFTP*	None	CTL.246.00
CORGZ5	IJBLBV*	CTL.226.00	PDAIDFTT*	None	CTL.247.00
CORGZ6	IJBLBW*	CTL.226.25	PDAIDFTW*	None	CTL.248.00
CORGZ7	IJBLBX*	CTL.226.50	PDAIDGTP*	None	CTL.249.00
CORGZ8	IJBLBY*	CTL.226.75	PDAIDGTT*	None	CTL.250.00
CSERV	IJBLBP*	CTL.221.00	PDAIDGTW*	None	CTL.251.00
			PDAIDITP*	None	CTL.252.00
DSERV	IJBLS1*	CTL.243.00	PDIADITT*	None	CTL.253.00
DSERV1	IJBLS1*	CTL.243.00	PDAIDITW*	None	CTL.254.00
DSERV2	IJBLS1*	CTL.243.00	PDAIDQTT*	None	CTL.255.00
DSERV3	IJBLS1*	CTL.243.00	PDAIDQTW*	None	CTL.256.00
DSERV4	IJBLS1*	CTL.243.00	PDAIDTDP*	None	CTL.256.25
DSERV5	IJBLS1*	CTL.243.00	PDAIDTDT*	None	CTL.256.50
DUMPGEN	IJBDMPGN*	CTL.187.50	PDLST	IJBPDLS*	CTL.241.70
DUMPGEN1	IJBDMPGN*	CTL.187.50			
			RSERV	IJBLS3*	CTL.244.00
EREP	IJBREP*	CTL.193.00			
EREPASSM	IJBEASSM*	CTL.188.00	SSERV	IJBLS4*	CTL.245.00
EREPCI30	IJBECI30*	CTL.189.00	SYSBUFF1	IJBSSUFF*	CTL.242.50
EREPCI40	IJBECI40*	CTL.190.00	SYSBUFLD	IJBSSUFF*	CTL.242.50
EREPCI45	IJBECI45*	CTL.190.50			
EREPCI50	IJBECI50*	CTL.191.00	None	IJBLBA*	CTL.209.00
EREPCI55	IJBECI55*	CTL.191.50	None	IJBLBC*	CTL.210.00
			None	IJBPCS*	CTL.233.00
			None	IJBMS*	CTL.237.00

*Used as the microfiche card label.

None	IJBMDU*	CTL.238.00	IOTAB	A,B	453.008.50
None	IJBMI0*	CTL.240.00			
None	IJB MUP*	CTL.241.00			
None	IJBRSTRT*	CTL.242.00	LBRET	C	453.008.00
None	IJBTRA11*	CTL.245.50	LOAD	D	453.008.00
None	IJBTRG11*	CTL.245.60	LUBGEN	E	453.008.00
None	IJBTRH11*	CTL.245.70			
None	IJBTRP11*	CTL.245.80			
None	IJBTRT11*	CTL.245.90	MAPLOWC	D	453.008.50
			MCRAS	A	453.008.60
			MVCOM	A	453.009.00
			NOTE	B	453.009.00
<u>Macro Name</u>	<u>Row</u>	<u>Card ID</u>			
			OPEN	C	453.009.00
ALLOC	A	453.001.00	OPENR	D	453.009.00
ASSGN	B	453.001.00			
ATTACH	A	453.001.50			
			PDUMP	E	453.009.00
			PIOCS	A	453.010.00
CALL	C	453.001.00	POINTR	B	453.010.00
CANCEL	D	453.001.00	POINTS	C	453.010.00
CCB	E	453.001.00	POINTW	D	453.010.00
CDMOD	A,B	453.002.00	POST	A	453.010.50
CHECK	C	453.002.00	PRMOD	E	453.010.00
CHKPT	D	453.002.00	PRTOV	A	453.011.00
CHNG	E	453.002.00	PUT	B	453.011.00
CLOSE	A	453.003.00			
CLOSER	B	453.003.00			
CNTRL	C	453.003.00	RCB	B	453.010.50
COMMN	D	453.003.00	READ	C	453.011.00
COMMNEX	A	453.003.50	RELEASE	E	453.012.50
COMRG	E	453.003.00	RELSE	D	453.011.00
CONFG	A	453.004.00	RETURN	E	453.011.00
DEQ	A	453.004.50			
DETACH	B	453.004.50	SAVE	A	453.012.00
DIMOD	B	453.004.00	SEND	A-D	453.012.50
DTFBG	C	453.004.00	SEOV	D	453.012.00
DTFCD	D	453.004.00	SETIME	E	453.012.00
DTFCN	E	453.004.00	SGDFCH	A,B	453.013.50
DTFDI	A	453.005.00	SGDSK	B	453.013.00
DTFEN	B	453.005.00	SGSVC	C-E	453.013.00
DTFPH	C	453.005.00	SGTCHS	A-D	453.014.00
DTFPR	D	453.005.00	SGTCON	A	453.014.01
DTFSR	E	453.005.00	SGTHAP	C-E	453.014.01
DUMP	A	453.006.00	SGUNCK	A,B	453.014.50
DVCGEN	B	453.006.00	SMCRR	B,C	453.012.00
			STDJC	B	453.015.00
ENQ	A	453.006.50	STXIT	C	453.015.00
EOJ	C	453.006.00	SUPVR	D	453.015.00
ERET	C	453.006.50			
EXCP	D	453.006.00			
EXIT	E	453.006.00	TECB	E	453.015.00
			TRTAB	B	453.014.01
FEOV	B	453.007.00	TRUNC	A	453.016.00
FEOVD	C	453.008.50			
FETCH	A	453.007.00			
FOPT	A-C	453.007.50	WAIT	B	453.016.00
FREE	B	453.006.50	WAITF	C	453.016.00
			WAITM	E	453.016.00
GET	E	453.007.00	WRITE	D	453.016.00
GETIME	A	453.008.00			

*Used as the microfiche card label.

LOGICAL IOCS: DAMOD

<u>Macro Name</u>	<u>Row</u>	<u>Card ID</u>
DAMOD	A, B	454.001.00
DAMODV	C-E	454.001.00
DTFDA	A-C	454.002.00

LOGICAL IOCS: DIMOD, ISMOD

<u>Macro Name</u>	<u>Row</u>	<u>Card ID</u>
DTFIS	A	457.001.00
DTFIS1	B	457.001.00
DTFIS2	C	457.001.00
DTFIS3	D	457.001.00
ENDFL	E	457.001.00
ESETL	A	457.002.00
ISMOD	B	457.002.00
ISMOD0	C	457.002.00
ISMOD1	D, E	457.002.00
ISMOD2	A, B	457.002.01
ISMOD3	A	457.003.00
ISMOD4	B	457.003.00
ISMOD5	C	457.003.00
ISMOD6	D, E	457.003.00
ISMOD7	A	457.004.00
ISMOD8	B	457.004.00
ISMOD9	A, B	457.005.00
SETFL	D	457.004.00
SETL	E	457.004.00

LOGICAL IOCS: MTMOD

<u>Macro Name</u>	<u>Row</u>	<u>Card ID</u>
DTFMT	A, B	456.001.00
MTMOD		456.001.00

LOGICAL IOCS: PTMOD

<u>Macro Name</u>	<u>Row</u>	<u>Card ID</u>
DTFPT	A, B	458.001.00
PTMOD	C-E	458.001.00

LOGICAL IOCS: SDMOD

<u>Macro Name</u>	<u>Row</u>	<u>Card ID</u>
DTFSD	A, B	455.001.00
SDMOD	C, D	455.001.00
SDMODFI	A, B	455.001.01
SDMODFO	C, D	455.001.01
SDMODFU	A-C	455.002.00
SDMODUI	D	455.002.00
SDMODUO	E	455.002.00
SDMODUU	A, B	455.002.01
SDMODVI	A, B	455.003.00
SDMODVO	C, D	455.003.00
SDMODVU	A-C	455.004.00
SDMODW	D, E	455.004.00

Note: Logical IOCS: CDMOD, CPMOD, DTFCN, and PRMOD are listed under System Control.

Logical IOCS: MRMOD is under MICR ERP.

Logical IOCS: ORMOD is under ORERP.

TELECOMMUNICATIONS ACCESS METHODS: BTAM

<u>Core Image</u>	<u>Relocatable</u>	<u>Card ID</u>
<u>Phase Name</u>	<u>Module Name</u>	
\$\$ANERAH*	None	CQB.000.25
\$\$ANERP2*	None	CQB.000.50
\$\$ANERP3	None	CQB.000.50
(\$\$ANERP2)		
\$\$ANERP4*	None	CQB.000.60
\$\$ANERP5*	None	CQB.000.65
\$\$ANERP6*	None	CQB.000.70
\$\$ANERR2*	None	CQB.001.00
\$\$ANERR3	None	CQB.001.00
(\$\$ANERR2)		
\$\$ANERR4	None	CQB.001.00
(\$\$ANERR2)		
\$\$ANERR5	None	CQB.001.00
(\$\$ANERR2)		
\$\$BCTC01*	None	CQB.002.00
\$\$BETPRT*	None	CQB.003.00
\$\$BHDRCK*	None	CQB.004.00
\$\$BLEPRT*	None	CQB.005.00
\$\$BLOPEN*	None	CQB.006.00
\$\$BOTC01*	None	CQB.007.00
\$\$BRESPL*	None	CQB.007.50
\$\$BTCNCL*	None	CQB.008.00
\$\$BTMEBG*	None	CQB.009.00
\$\$BT1030*	None	CQB.010.00
\$\$BT1050*	None	CQB.011.00

*Used as the microfiche card label.

\$\$BT1060*	None	CQB.012.00	None	IJLSCTW*	CQB.036.62
\$\$BT2260*	None	CQB.013.00	None	IJLSCT1*	CQB.036.65
\$\$BT2740*	None	CQB.014.00	None	IJLSCT2*	CQB.036.68
\$\$BT2848*	None	CQB.015.00	None	IJLSCT3*	CQB.036.71
			None	IJLSD30*	CQB.036.74
IJLBOT02*	None	CQB.015.05	None	IJLSD40*	CQB.036.77
IJLBOT03*	None	CQB.015.10	None	IJLSD50*	CQB.036.80
IJLBOT04*	None	CQB.015.15	None	IJLSD60*	CQB.036.83
IJLBOT05*	None	CQB.015.20	None	IJLSD80*	CQB.036.86
IJLBOT06*	None	CQB.015.25	None	IJLSSCI*	CQB.036.89
IJLBOT07*	None	CQB.015.30	None	IJLTCO*	CQB.037.00
IJLBOT08*	None	CQB.015.35	None	IJLWTZ*	CQB.037.50
IJLBOT09*	None	CQB.015.40	None	IJL0AY*	CQB.038.00
IJLBOT10*	None	CQB.015.45	None	IJL0BY*	CQB.051.00
IJLBOT11*	None	CQB.015.50	None	IJL0BZ*	CQB.052.00
IJLBOT12*	None	CQB.015.55	None	IJL0DY*	CQB.058.00
IJLBOT13*	None	CQB.015.60	None	IJL0DZ*	CQB.059.00
IJLBOT14*	None	CQB.015.65	None	IJL0EZ*	CQB.059.50
IJLBOT15*	None	CQB.015.70	None	IJL00Y*	CQB.060.00
IJLBOT16*	None	CQB.015.75	None	IJL01J*	CQB.061.00
IJLBOT17*	None	CQB.015.80	None	IJL01Z*	CQB.062.00
IJLBOT18*	None	CQB.015.85	None	IJL02J*	CQB.063.00
IJLBOT19*	None	CQB.015.90	None	IJL02Z*	CQB.064.00
IJLBOT20*	None	CQB.015.92	None	IJL03Z*	CQB.065.00
IJLBOT21*	None	CQB.015.94	None	IJL04Z*	CQB.066.00
IJLBOT22*	None	CQB.015.96	None	IJL05Z*	CQB.067.00
IJLT2ALC*	None	CQB.016.00	None	IJL06Z*	CQB.067.50
IJLT2ROT*	None	CQB.017.00	None	IJL07J*	CQB.068.00
IJLT2TLT*	None	CQB.018.00	None	IJL07Y*	CQB.069.00
IJLT2TWS*	None	CQB.019.00	None	IJL07Z*	CQB.070.00
IJLT3ALC*	None	CQB.020.00	None	IJL08H*	CQB.071.00
IJLT3ROT*	None	CQB.021.00	None	IJL08M*	CQB.072.00
IJLT3SLA*	None	CQB.022.00	None	IJL08P*	CQB.073.00
IJLT3TLT*	None	CQB.023.00	None	IJL08Q*	CQB.074.00
IJLT3TWS*	None	CQB.024.00	None	IJL08R*	CQB.075.00
IJLT5ALC*	None	CQB.025.00	None	IJL08U*	CQB.076.00
IJLT5ROT*	None	CQB.026.00	None	IJL08X*	CQB.077.00
IJLT5SLA*	None	CQB.027.00	None	IJL08Y*	CQB.078.00
IJLT5TLT*	None	CQB.028.00	None	IJL08Z*	CQB.079.00
IJLT5TWS*	None	CQB.029.00	None	IJL081*	CQB.079.60
IJLT6ALC*	None	CQB.030.00	None	IJL082*	CQB.079.70
IJLT6ROT*	None	CQB.031.00	None	IJL089*	CQB.080.00
IJLT6SLA*	None	CQB.032.00	None	IJL09Y*	CQB.081.00
IJLT6TLT*	None	CQB.033.00	None	IJL1BZ*	CQB.081.50
IJLT6WS*	None	CQB.034.00	None	IJL1CZ*	CQB.082.00
			None	IJL1DZ*	CQB.083.00
			None	IJL2DZ*	CQB.084.00
			None	IJL1OY*	CQB.085.00
None	IJLASC*	CQB.035.00			
None	IJLEBD*	CQB.036.00			
None	IJLEDIT3*	CQB.086.00			
None	IJLRASA*	CQB.036.20			
None	IJLRCTW*	CQB.036.23	<u>Macro Name</u>	<u>Row</u>	<u>Card ID</u>
None	IJLRCT1*	CQB.036.26	AS	A	469.002.01
None	IJLRCT2*	CQB.036.29	ASCTR	A	469.008.00
None	IJLRCT3*	CQB.036.32	ASLIST	B	469.002.01
None	IJLRC30*	CQB.036.35	ASMTRTAB	A	469.002.00
None	IJLRC40*	CQB.036.38			
None	IJLRC50*	CQB.036.41			
None	IJLRC60*	CQB.036.44	BTMOD	A	469.001.00
None	IJLRC80*	CQB.036.47	BTRD	B	469.002.00
None	IJLRF40*	CQB.036.50	BTRWC	A,B	469.007.00
None	IJLRF50*	CQB.036.53	BTWAIT	C	469.002.00
None	IJLRSCI*	CQB.036.56			
None	IJLSASA*	CQB.036.59	CHGNTY	D	469.002.00
			CONFIGUR	C	469.002.01
			CONTROL	E	469.002.00
			CTGROUP	B	469.008.00

*Used as the microfiche card label.

CTRLIST	D	469.008.00	None	IJLQAA*	CQQ.022.00
CTRSCHED	C	469.008.00	None	IJLQAD*	CQQ.023.00
			None	IJLQBO*	CQQ.024.00
DEULIST	D	469.002.01	None	IJLQCK*	CQQ.025.00
DFTRMLST	A	469.003.00	None	IJLQCL*	CQQ.026.00
DTFBT	B,C	469.003.00	None	IJLQCM*	CQQ.027.00
DTFBTND	D	469.003.00	None	IJLQCP*	CQQ.028.00
			None	IJLQCR*	CQQ.029.00
IJLBTMDS	E	469.003.00	None	IJLQCT*	CQQ.030.00
			None	IJLQDA*	CQQ.031.00
LERB	A	469.004.00	None	IJLQDC*	CQQ.032.00
LERPRT	B	469.004.00	None	IJLQDE*	CQQ.033.00
LOPEN	C	469.004.00	None	IJLQDL*	CQQ.034.00
			None	IJLQDP*	CQQ.035.00
ONLTST	D	469.005.00	None	IJLQDQ*	CQQ.036.00
			None	IJLQDT*	CQQ.037.00
RELBUF	D	469.004.00	None	IJLQEA*	CQQ.038.00
REQBUF	E	469.004.00	None	IJLQEB*	CQQ.039.00
RESETPL	A	469.005.00	None	IJLQEC*	CQQ.040.00
			None	IJLQER*	CQQ.042.00
SDRTAB	E	469.005.00	None	IJLQEX*	CQQ.043.00
STEND	A	469.006.01	None	IJLQFL*	CQQ.044.00
			None	IJLQGA*	CQQ.045.00
TGROUP	B	469.006.01	None	IJLQGB*	CQQ.046.00
TPEDIT	C	469.006.01	None	IJLQGC*	CQQ.047.00
TRANSLATE	B	469.005.00	None	IJLQGD*	CQQ.048.00
TRLIST	D	469.006.01	None	IJLQGM*	CQQ.049.00
TRSRCTW	C	469.006.00	None	IJLQGR*	CQQ.050.00
TRSRCT3	D	469.006.00	None	IJLQGS*	CQQ.051.00
TRSSCTW	A	469.006.00	None	IJLQIP*	CQQ.052.00
TRSSCT3	B	469.006.00	None	IJLQIT*	CQQ.053.00
TWAIT	C	469.005.00	None	IJLQLA*	CQQ.054.00
			None	IJLQLC*	CQQ.054.50
			None	IJLQLG*	CQQ.055.00
			None	IJLQLK*	CQQ.056.00
			None	IJLQLO*	CQQ.057.00
			None	IJLQMC*	CQQ.058.00
			None	IJLQMI*	CQQ.059.00
			None	IJLQMM*	CQQ.060.00
			None	IJLQMP*	CQQ.061.00
			None	IJLQMT*	CQQ.062.00
			None	IJLQMW*	CQQ.063.00
			None	IJLQM0*	CQQ.064.00
			None	IJLQM1*	CQQ.065.00
			None	IJLQM2*	CQQ.066.00
			None	IJLQM3*	CQQ.067.00
			None	IJLQM4*	CQQ.068.00
			None	IJLQM5*	CQQ.069.00
			None	IJLQM6*	CQQ.070.00
			None	IJLQM8*	CQQ.071.00
			None	IJLQM9*	CQQ.072.00
			None	IJLQN0*	CQQ.073.00
			None	IJLQN1*	CQQ.074.00
			None	IJLQN2*	CQQ.075.00
			None	IJLQN3*	CQQ.076.00
			None	IJLQN4*	CQQ.077.00
			None	IJLQN5*	CQQ.078.00
			None	IJLQN6*	CQQ.079.00
			None	IJLQN7*	CQQ.080.00
			None	IJLQN8*	CQQ.080.50
			None	IJLQOA*	CQQ.081.00
			None	IJLQOB*	CQQ.081.50
			None	IJLQOC*	CQQ.082.00
			None	IJLQPA*	CQQ.083.00
			None	IJLQPL*	CQQ.084.00
			None	IJLQPM*	CQQ.085.00
			None	IJLQPR*	CQQ.086.00
			None	IJLQPS*	CQQ.087.00

TELECOMMUNICATIONS ACCESS METHODS: QTAM

<u>Core Image</u>	<u>Relocatable</u>	<u>Card ID</u>
<u>Phase Name</u>	<u>Module Name</u>	<u>Card ID</u>
\$\$BCQC01*	None	CQQ.001.00
\$\$BCQC02*	None	CQQ.002.00
\$\$BCQC03*	None	CQQ.003.00
\$\$BOQO01*	None	CQQ.004.00
\$\$BOQO02*	None	CQQ.005.00
\$\$BOQO03*	None	CQQ.006.00
\$\$BOQO04*	None	CQQ.007.00
\$\$BOQO06*	None	CQQ.007.50
\$\$BOQO07*	None	CQQ.008.00
\$\$BOQO08*	None	CQQ.009.00
\$\$BQCNCNCL*	None	CQQ.010.00
\$\$BQCNCM*	None	CQQ.011.00
\$\$BQHDCK*	None	CQQ.012.00
\$\$BQWTRA*	None	CQQ.013.00
\$\$BQWTR1*	None	CQQ.014.00
\$\$BQWTR2*	None	CQQ.015.00
\$\$BQWTR3*	None	CQQ.016.00
\$\$BQ1030*	None	CQQ.017.00
\$\$BQ1050*	None	CQQ.018.00
\$\$BQ1060*	None	CQQ.019.00
\$\$BQ2260*	None	CQQ.020.00
\$\$BQ2740*	None	CQQ.021.00

*Used as the microfiche card label.

None	IJLQPZ*	CQQ.088.00	COUNTER	E	470.003.00
None	IJLQQT*	CQQ.089.00	CTLBL	A	470.003.01
None	IJLQRA*	CQQ.090.00			
None	IJLQRB*	CQQ.090.50			
None	IJLQRC*	CQQ.090.60	DATESTMP	A	470.004.00
None	IJLQRD*	CQQ.091.00	DIRECT	B	470.004.00
None	IJLQRG*	CQQ.092.00	DTFQT		470.004.00
None	IJLQRM*	CQQ.093.00			
None	IJLQRR*	CQQ.094.00	ENDRCV	A	470.005.00
None	IJLQRS*	CQQ.095.00	ENDREADY	B	470.005.00
None	IJLQRW*	CQQ.096.00	ENDSEND	C	470.005.00
None	IJLQR1*	CQQ.097.00	EOA	D	470.005.00
None	IJLQR2*	CQQ.098.00	EOB	E	470.005.00
None	IJLQR3*	CQQ.099.00	EOBLC	A	470.006.00
None	IJLQR4*	CQQ.100.00	ERRMSG	B	470.006.00
None	IJLQR5*	CQQ.101.00			
None	IJLQR6*	CQQ.102.00	IJLQBABD	C	470.006.00
None	IJLQR7*	CQQ.103.00	IJLQBFRD	D	470.006.00
None	IJLQR8*	CQQ.104.00	IJLQBRBD	E	470.006.00
None	IJLQR9*	CQQ.105.00	IJLQCKPD	A	470.007.00
None	IJLQSB*	CQQ.105.50	IJLQCTLD	A	470.007.50
None	IJLQSC*	CQQ.105.60	IJLQDEQU	B	470.007.00
None	IJLQSH*	CQQ.106.00	IJLQDSCT	C	470.007.00
None	IJLQSI*	CQQ.107.00	IJLQDTFD	D, E	470.007.00
None	IJLQSK*	CQQ.108.00	IJLQIP1D	A	470.008.00
None	IJLQSO*	CQQ.109.00	IJLQLABD	B	470.008.00
None	IJLQSR*	CQQ.110.00	IJLQLCBD	C	470.008.00
None	IJLQSS*	CQQ.111.00	IJLQMCBD	D	470.008.00
None	IJLQST*	CQQ.112.00	IJLQOBRD	B	470.007.50
None	IJLQS1*	CQQ.113.00	IJLQQCBD	E	470.008.00
None	IJLQS2*	CQQ.114.00	IJLQSTBD	A	470.009.00
None	IJLQS4*	CQQ.115.00	IJLQSVCD	B	470.009.00
None	IJLQS5*	CQQ.116.00	IJLQTBLD	C	470.009.00
None	IJLQS6*	CQQ.117.00	IJLQTSVC	D	470.009.00
None	IJLQS7*	CQQ.118.00	IJLQVECD	E	470.009.00
None	IJLQS8*	CQQ.119.00	INTERCPT	A	470.010.00
None	IJLQS9*	CQQ.120.00			
None	IJLQTA*	CQQ.120.50	LCBD	B	470.010.00
None	IJLQTR*	CQQ.121.00	LINE	C	470.010.00
None	IJLQTS*	CQQ.122.00	LINETBL	D	470.010.00
None	IJLQTT*	CQQ.123.00	LIST	E	470.010.00
			LOGSEG	A	470.011.00
			LPSTART	B	470.011.00
			MODE	C	470.011.00
			MSGTYPE	D	470.011.00
			OPCTL	E	470.011.00
			OPTION	A	470.012.00
			PAUSE	B	470.012.00
			POLL	C	470.012.00
			POLLIMIT	D	470.012.00
			POSTARU	E	470.012.00
			POSTRCV	A	470.013.00
			POSTSEND	B	470.013.00
			PREFIXD	C	470.013.00
			PROCESS	D	470.012.00
			QCBD	E	470.013.00
			RCVHDR	A	470.014.00
			RCVITA2	A	470.019.00
			RCVSC32	B	470.019.00
			RCVSEG	B	470.014.00
			RELEASEM	C	470.014.00
			REPEAT	D	470.014.00
			REROUTE	E	470.014.00

<u>Macro Name</u>	<u>Row</u>	<u>Card ID</u>
ARUMGTYP	A	470.001.00
BREAKOFF	B	470.001.00
BUFARU	C	470.001.00
BUFFER	D	470.001.00
CANCELM	E	470.001.00
CHECKARU	A	470.002.00
CHNGP	B	470.002.00
CHNGT	C	470.002.00
CKREQ	D	470.002.00
CLOSEMC	E	470.002.00
COPYC	A	470.003.00
COPYP	B	470.003.00
COPYQ	C	470.003.00
COPYT	D	470.003.00

*Used as the microfiche card label.

RETRIEVE	A	470.015.00
ROUTE	B	470.015.00
SENDHDR	C	470.015.00
SENDSEG	D	470.015.00
SEQIN	E	470.015.00
SEQOUT	A	470.016.00
SKIP	B	470.016.00
SNDITA2	C	470.019.00
SNDZSC3	D	470.019.00
SOURCE	C	470.016.00
STARTARU	D	470.016.00
STARTLN	E	470.016.00
STCBD	A	470.017.00
STOPARU	B	470.017.00
STOPLN	C	470.017.00
TERM	D	470.017.00
TERMTBL	E	470.017.00
TERMTBLD	A	470.018.00
TIMESTMP	B	470.018.00
TRANS	C	470.018.00
WORD	D	470.018.00
WORDTBL	E	470.018.00
WRU	E	470.019.00

ASSEN07A	IJQD7\$\$*	ASC.014.50
ASSEN07C	IJQD7\$*	ASC.014.00
ASSEN07C	IJQD7\$\$*	ASC.014.50
ASSEN07I	IJQD7I*	ASC.015.00
ASSEN08	IJQD8\$*	ASC.016.00
ASSEN08	IJQD8\$\$*	ASC.016.50
ASSEN08A	IJQD8\$*	ASC.016.00
ASSEN08A	IJQD8\$\$*	ASC.016.50
ASSEN08C	IJQD8\$*	ASC.016.00
ASSEN08C	IJQD8\$\$*	ASC.016.50
ASSEN088	IJQRTB*	ASC.017.00
ASSEN09	IJQD9\$*	ASC.018.00
ASSEN09	IJQD9\$\$*	ASC.018.50
ASSEN09I	IJQD9I*	ASC.019.00
ASSEN09I	IJQD9I\$*	ASC.019.50
ASSEN10	IJQ10\$*	ASC.020.00
ASSEN10	IJQ10\$\$*	ASC.020.50
ASSEN10B	IJQ10B*	ASC.021.00
ASSEN10B	IJQ10B\$*	ASC.021.50
ASSEN11A	IJQ21A*	ASC.022.00
ASSEN11A	IJQ21A\$*	ASC.022.50
ASSEN11B	IJQ21B*	ASC.023.00
ASSEN11C	IJQ21B*	ASC.023.00
ASSEN11D	IJQ21B*	ASC.023.00
ASSEN11E	IJQ21B*	ASC.023.00
ASSEN12	IJQDPP*	ASC.024.00
ASSEN13	IJQDIA*	ASC.025.00
ASSEN13	IJQDIA\$*	ASC.025.50
ASSEN14	IJQABT*	ASC.026.00

ASSEMBLER D

Core Image Relocatable
Phase Name Module Name Card ID

ASSEMBLY	IJQD0\$*	ASC.001.00
ASSEMBLY	IJQD0A*	ASC.002.00
ASSEM00A	IJQD0\$*	ASC.001.00
ASSEM00A	IJQD0A*	ASC.002.00
ASSEM00B	IJQD0\$*	ASC.001.00
ASSEM00B	IJQD0A*	ASC.002.00
ASSEM02	IJQD2\$*	ASC.003.00
ASSEM02	IJQD2\$\$*	ASC.003.50
ASSEM02A	IJQD2A*	ASC.004.00
ASSEM03	IJQD3\$*	ASC.005.00
ASSEM03	IJQD3\$\$*	ASC.005.50
ASSEM03A	IJQD3A*	ASC.006.00
ASSEM03A	IJQD3A\$*	ASC.006.50
ASSEM04	IJQD4P*	ASC.007.00
ASSEM04A	IJQD4M*	ASC.008.00
ASSEM04A	IJQD4M\$*	ASC.008.50
ASSEM04B	IJQD4A*	ASC.009.00
ASSEM04B	IJQD4A\$*	ASC.009.50
ASSEM05	IJQD5P*	ASC.010.00
ASSEM05	IJQD5P\$*	ASC.010.50
ASSEM05A	IJQD5M*	ASC.011.00
ASSEM05A	IJQD5M\$*	ASC.011.50
ASSEM05B	IJQD5A*	ASC.012.00
ASSEM05B	IJQD5A\$*	ASC.012.50
ASSEM06	IJQRTA*	ASC.013.00
ASSEN07	IJQD7\$*	ASC.014.00
ASSEN07	IJQD7\$\$*	ASC.014.50
ASSEN07A	IJQD7\$*	ASC.014.00

*Used as the microfiche card label.

ASSEMBLER F

Core Image Relocatable
Phase Name Module Name Card ID

ASSEMABT	IJYABT*	ASF.001.00
ASSEMBLY	IJYCM*	ASF.002.00
ASSEMBLY	IJYF0*	ASF.003.00
ASSEMBLY	IJYF1*	ASF.004.00
ASSEMBLY	IJYF2*	ASF.005.00
ASSEMBLY	IJYIN*	ASF.006.00
ASSEMFI	IJYF10*	ASF.007.00
ASSEMFI	IJYRTB*	ASF.008.00
ASSEMFPF	IJYFD*	ASF.009.00
ASSEMFPF	IJYFPP*	ASF.010.00
ASSEMFP8	IJYF8A*	ASF.011.00
ASSEMFP8	IJYF8C*	ASF.012.00
ASSEMFP8	IJYF8D*	ASF.013.00
ASSEMFP8	IJYF8I*	ASF.014.00
ASSEMFP8	IJYF8L*	ASF.015.00
ASSEMFP8	IJYF8M*	ASF.016.00
ASSEMFP8	IJYF8N*	ASF.017.00
ASSEMFP8	IJYF8P*	ASF.018.00
ASSEMFP8	IJYF8S*	ASF.019.00
ASSEMFP8	IJYF8V*	ASF.020.00
ASSEM3	IJYF3*	ASF.021.00
ASSEM3E	IJYF3E*	ASF.022.00
ASSEM7	IJYF7C*	ASF.023.00
ASSEM7	IJYF7D*	ASF.024.00
ASSEM7	IJYF7E*	ASF.025.00
ASSEM7	IJYF7G*	ASF.026.00
ASSEM7	IJYF7I*	ASF.027.00
ASSEM7	IJYF7L*	ASF.028.00

ASSEM7	IJYF7N*	ASF.029.00	None	IJCUZOI5*	IO.049.00
ASSEM7	IJYF7S*	ASF.030.00	None	IJCUZOZ1*	IO.050.00
ASSEM7	IJYF7V*	ASF.031.00	None	IJCUZOZ4*	IO.051.00
ASSEM7	IJYF7X*	ASF.032.00	None	IJCUZOZ5*	IO.052.00
ASSEM7	IJYRTA*	ASF.033.00	None	IJCVAOI1*	IO.053.00
			None	IJCVAOI4*	IO.054.00
			None	IJCVAOI5*	IO.055.00
			None	IJCVAOZ1*	IO.056.00
			None	IJCVAOZ4*	IO.057.00
			None	IJCVAOZ5*	IO.058.00
			None	IJCVZOI1*	IO.059.00
			None	IJCVZOI4*	IO.060.00
			None	IJCVZOI5*	IO.061.00
			None	IJCVZOZ1*	IO.062.00
			None	IJCVZOZ4*	IO.063.00
			None	IJCVZOZ5*	IO.064.00

COMPILER I/O MODULES

<u>Core Image</u>	<u>Relocatable</u>				
<u>Phase Name</u>	<u>Module Name</u>	<u>Card ID</u>			
None	IJCFAOI0*	IO.001.00	None	IJDFAPIZ*	IO.065.00
None	IJCFAOI1*	IO.002.00	None	IJDFAPIZ*	IO.066.00
None	IJCFAOI2*	IO.003.00	None	IJDFAZIZ*	IO.067.00
None	IJCFAOI4*	IO.004.00	None	IJDFAZZZ*	IO.068.00
None	IJCFAOI5*	IO.005.00	None	IJDFYPIZ*	IO.069.00
None	IJCFAOZ0*	IO.006.00	None	IJDFYPPZ*	IO.070.00
None	IJCFAOZ1*	IO.007.00	None	IJDFYPPZ*	IO.071.00
None	IJCFAOZ2*	IO.008.00	None	IJDFYZIZ*	IO.072.00
None	IJCFAOZ4*	IO.009.00	None	IJDFYZZZ*	IO.073.00
None	IJCFAOZ5*	IO.010.00	None	IJDFZPIZ*	IO.074.00
None	IJCFCCZ0*	IO.011.00	None	IJDFZPZZ*	IO.075.00
None	IJCFCCZ1*	IO.012.00	None	IJDUAPIZ*	IO.076.00
None	IJCFCCZ2*	IO.013.00	None	IJDUAPZZ*	IO.077.00
None	IJCFCIZ0*	IO.014.00	None	IJDUIPIZ*	IO.078.00
None	IJCFCIZ1*	IO.015.00	None	IJDUIPZZ*	IO.079.00
None	IJCFCIZ2*	IO.016.00	None	IJDUZPIZ*	IO.080.00
None	IJCFYOI0*	IO.017.00	None	IJDUZPZZ*	IO.081.00
None	IJCFYOI1*	IO.018.00	None	IJDVAPIZ*	IO.082.00
None	IJCFYOI2*	IO.019.00	None	IJDVAPZZ*	IO.083.00
None	IJCFYOI4*	IO.020.00	None	IJDVYPIZ*	IO.084.00
None	IJCFYOZ0*	IO.021.00	None	IJDVYPZZ*	IO.085.00
None	IJCFYOZ1*	IO.022.00	None	IJDVZPIZ*	IO.086.00
None	IJCFYOZ2*	IO.023.00	None	IJDVZPZZ*	IO.087.00
None	IJCFYOZ4*	IO.024.00			
None	IJCFZII0*	IO.025.00	None	IJFFBCZZ*	IO.088.00
None	IJCFZII1*	IO.026.00	None	IJFFBZZN*	IO.089.00
None	IJCFZII2*	IO.027.00	None	IJFFBZZZ*	IO.090.00
None	IJCFZII3*	IO.028.00	None	IJFFZCZZ*	IO.091.00
None	IJCFZIZ0*	IO.029.00	None	IJFFZZZZ*	IO.092.00
None	IJCFZIZ1*	IO.030.00	None	IJFSZZWN*	IO.093.00
None	IJCFZIZ2*	IO.031.00	None	IJFUBCZZ*	IO.094.00
None	IJCFZIZ3*	IO.032.00	None	IJFUBZZZ*	IO.095.00
None	IJCFZOI1*	IO.033.00	None	IJFUZZZN*	IO.096.00
None	IJCFZOI2*	IO.034.00	None	IJFUZZZZ*	IO.097.00
None	IJCFZOI4*	IO.035.00	None	IJFVBCWZ*	IO.098.00
None	IJCFZOI5*	IO.036.00	None	IJFVBCZZ*	IO.099.00
None	IJCFZOZ1*	IO.037.00	None	IJFVZCZW*	IO.100.00
None	IJCFZOZ2*	IO.038.00	None	IJFVZZZN*	IO.101.00
None	IJCFZOZ4*	IO.039.00	None	IJFVZZZZ*	IO.102.00
None	IJCFZOZ5*	IO.040.00	None	IJFWEZZZ*	IO.103.00
None	IJCUAOI1*	IO.041.00	None	IJFWZNZZ*	IO.104.00
None	IJCUAOI4*	IO.042.00	None	IJFWZZZZ*	IO.105.00
None	IJCUAOI5*	IO.043.00			
None	IJCUAOZ1*	IO.044.00	None	IJGFIETZ*	IO.106.00
None	IJCUAOZ4*	IO.045.00	None	IJGFIEWZ*	IO.107.00
None	IJCUAOZ5*	IO.046.00	None	IJGFIEZZ*	IO.108.00
None	IJCUZOI1*	IO.047.00	None	IJGFIZZZ*	IO.109.00
None	IJCUZOI4*	IO.048.00	None	IJGFOEWZ*	IO.110.00
			None	IJGFOEZZ*	IO.111.00
			None	IJGFOZZZ*	IO.112.00
			None	IJGFUETZ*	IO.113.00

 *Used as the microfiche card label.

None	IJGFUEWZ*	IO.114.00	None	IJHZRRZZ*	IO.176.00
None	IJGFUEZZ*	IO.115.00	None	IJHZRSZZ*	IO.177.00
None	IJGFUZZZ*	IO.116.00	None	IJIBAIRZ*	IO.178.00
None	IJGQIEWZ*	IO.117.00	None	IJIBAIZZ*	IO.179.00
None	IJGQIEZZ*	IO.118.00	None	IJIBAZRZ*	IO.180.00
None	IJGQOEWZ*	IO.119.00	None	IJIBAZZZ*	IO.181.00
None	IJGQOZZZ*	IO.120.00	None	IJIBZIRZ*	IO.182.00
None	IJGQUEWZ*	IO.121.00	None	IJIBZIZZ*	IO.183.00
None	IJGQUEZZ*	IO.122.00	None	IJIBZZRZ*	IO.184.00
None	IJGUIEWZ*	IO.123.00	None	IJIBZZZZ*	IO.185.000
None	IJGUIEZZ*	IO.124.00	None	IJIFAIRZ*	IO.186.00
None	IJGUIZZZ*	IO.125.00	None	IJIFAIZZ*	IO.187.00
None	IJGUOEWZ*	IO.126.00	None	IJIFAZRZ*	IO.188.00
None	IJGUOZZZ*	IO.127.00	None	IJIFAZZZ*	IO.189.00
None	IJGUOZZZ*	IO.128.00	None	IJIFZIRZ*	IO.190.00
None	IJGUUEWZ*	IO.129.00	None	IJIFZIZZ*	IO.191.00
None	IJGUUEZZ*	IO.130.00	None	IJIFZZRZ*	IO.192.00
None	IJGUUZZZ*	IO.131.00	None	IJIFZZZZ*	IO.193.00
None	IJGVIEWZ*	IO.132.00	None	IJISAIRZ*	IO.194.00
None	IJGVIEZZ*	IO.133.00	None	IJISAIZZ*	IO.195.00
None	IJGVIZZZ*	IO.134.00	None	IJISAZRZ*	IO.196.00
None	IJGVOEWZ*	IO.135.00	None	IJISAZZZ*	IO.197.00
None	IJGVOZZZ*	IO.136.00	None	IJISZIRZ*	IO.198.00
None	IJGVOZZZ*	IO.137.00	None	IJISZIZZ*	IO.199.00
None	IJGVUEWZ*	IO.138.00	None	IJISZZRZ*	IO.200.00
None	IJGVUEZZ*	IO.139.00	None	IJISZZZZ*	IO.201.00
None	IJGVUZZZ*	IO.140.00			
None	IJGWEZZU*	IO.141.00	None	IJJCPA1N*	IO.201.50
None	IJGWEZZZ*	IO.142.00	None	IJJCP0*	IO.203.00
None	IJGWZNZZ*	IO.143.00	None	IJJCP1*	IO.204.00
None	IJGWZRZZ*	IO.144.00	None	IJJCP2*	IO.205.00
None	IJHAABCP*	IO.144.25	None	IJJCP3*	IO.206.00
None	IJHAABZ*	IO.144.50	None	IJJCPDV*	IO.207.00
None	IJHAABZP*	IO.144.75	None	IJJCPD0*	IO.208.00
None	IJHAABZZ*	IO.145.00	None	IJJCPD1*	IO.209.00
None	IJHAARCP*	IO.146.00	None	IJJCPD2*	IO.210.00
None	IJHAARCZ*	IO.147.00	None	IJJCPD3*	IO.211.00
None	IJHAARZP*	IO.148.00	None	IJJCPV*	IO.202.00
None	IJHAARZZ*	IO.149.00	None	IJJCPV1*	IO.212.00
None	IJHAASZZ*	IO.150.00	None	IJJCPV2*	IO.213.00
None	IJHAIZZZ*	IO.151.00	None	IJJCP0N*	IO.214.00
None	IJHBABCP*	IO.152.00	None	IJJCP1N*	IO.215.00
None	IJHBABZ*	IO.153.00	None	IJJCPDV1*	IO.216.00
None	IJHBABZP*	IO.154.00	None	IJJCPDV2*	IO.217.00
None	IJHBABZZ*	IO.155.00	None	IJJCPDON*	IO.218.00
None	IJHBARCP*	IO.156.00	None	IJJCPD1N*	IO.219.00
None	IJHBARCZ*	IO.157.00	None	IJJFCBID*	IO.220.00
None	IJHBARZP*	IO.158.00	None	IJJFCBZD*	IO.221.00
None	IJHBARZZ*	IO.159.00	None	IJJFCIID*	IO.222.00
None	IJHBASZZ*	IO.160.00	None	IJJFCIZD*	IO.223.00
None	IJHBIZZZ*	IO.161.00			
None	IJHUABCP*	IO.162.00			
None	IJHUABCZ*	IO.163.00			
None	IJHUABZP*	IO.164.00			
None	IJHUABZZ*	IO.165.00			
None	IJHUARCP*	IO.166.00			
None	IJHUARCZ*	IO.167.00			
None	IJHUARZP*	IO.168.00			
None	IJHUARZZ*	IO.169.00			
None	IJHUASZZ*	IO.170.00			
None	IJHUIZZZ*	IO.171.00			
None	IJHZLZZZ*	IO.172.00			
None	IJHZRBCZ*	IO.173.00			
None	IJHZRBZZ*	IO.174.00			
None	IJHZRRCZ*	IO.175.00			

COBOL D

<u>Core Image</u>	<u>Relocatable</u>	<u>Card ID</u>
<u>Phase Name</u>	<u>Module Name</u>	
\$\$BCBLIS*	None	CBL.000.50
\$\$BCBLOP*	None	CBL.001.00
\$\$BCBODA*	None	CBL.002.00
\$\$BCBUSR*	None	CBL.003.00
\$\$BCBUSW*	None	CBL.004.00

*Used as the microfiche card label.

COBOL	IJSCBL01*	CBL.047.00	None	IHD01200*	CBL.017.00
COBOL000	IJSCBL02*	CBL.048.00	None	IHD01300*	CBL.018.00
COBOL000	IJSCBL03*	CBL.049.00	None	IHD01400*	CBL.019.00
COBOL001	IJSCBL04*	CBL.050.00	None	IHD01500*	CBL.020.00
COBOL001	IJSCBL05*	CBL.051.00	None	IHD01600*	CBL.021.00
COBOL002	IJSCBL06*	CBL.052.00	None	IHD01700*	CBL.022.00
COBOL003	IJSCBL07*	CBL.053.00	None	IHD01800*	CBL.023.00
COBOL004	IJSCBL08*	CBL.054.00	None	IHD01900*	CBL.024.00
COBOL005	IJSCBL09*	CBL.055.00	None	IHD02000*	CBL.025.00
COBOL006	IJSCBL10*	CBL.056.00	None	IHD02100*	CBL.026.00
COBOL007	IJSCBL11*	CBL.057.00	None	IHD02200*	CBL.027.00
COBOL008	IJSCBL12*	CBL.058.00	None	IHD02300*	CBL.028.00
COBOL009	IJSCBL13*	CBL.059.00	None	IHD02400*	CBL.029.00
COBOL010	IJSCBL14*	CBL.060.00	None	IHD02500*	CBL.030.00
COBOL011	IJSCBL15*	CBL.061.00	None	IHD02600*	CBL.031.00
COBOL012	IJSCBL16*	CBL.062.00	None	IHD02700*	CBL.032.00
COBOL013	IJSCBL17*	CBL.063.00	None	IHD02800*	CBL.033.00
COBOL014	IJSCBL18*	CBL.064.00	None	IHD02900*	CBL.034.00
COBOL015	IJSCBL19*	CBL.065.00	None	IHD03000*	CBL.035.00
COBOL016	IJSCBL20*	CBL.066.00	None	IHD03100*	CBL.036.00
COBOL017	IJSCBL21*	CBL.067.00	None	IHD03200*	CBL.037.00
COBOL018	IJSCBL22*	CBL.068.00	None	IHD03300*	CBL.038.00
COBOL019	IJSCBL23*	CBL.069.00	None	IHD03400*	CBL.039.00
COBOL020	IJSCBL24*	CBL.070.00	None	IHD03500*	CBL.040.00
COBOL021	IJSCBL25*	CBL.071.00	None	IHD03600*	CBL.041.00
COBOL022	IJSCBL26*	CBL.072.00	None	IHD03700*	CBL.042.00
COBOL023	IJSCBL27*	CBL.073.00	None	IHD03800*	CBL.043.00
COBOL024	IJSCBL28*	CBL.074.00	None	IHD03900*	CBL.044.00
COBOL025	IJSCBL29*	CBL.075.00	None	IHD04000*	CBL.045.00
COBOL027	IJSCBL31*	CBL.076.00	None	IHD04100*	CBL.046.00
COBOL028	IJSCBL32*	CBL.077.00			
COBOL028	IJSCBL33*	CBL.078.00			
COBOL029	IJSCBL34*	CBL.079.00			
COBOL030	IJSCBL35*	CBL.080.00			
COBOL031	IJSCBL36*	CBL.081.00			
COBOL032	IJSCBL37*	CBL.082.00			
COBOL033	IJSCBL38*	CBL.083.00			
COBOL034	IJSCBL39*	CBL.084.00			
COBOL035	IJSCBL40*	CBL.085.00			
COBOL036	IJSCBL41*	CBL.086.00			
COBOL037	IJSCBL42*	CBL.087.00			
COBOL038	IJSCBL43*	CBL.088.00			
COBOL039	IJSCBL44*	CBL.089.00			
COBOL040	IJSCBL45*	CBL.090.00			
COBOL041	IJSCBL46*	CBL.091.00			
COBOL042	IJSCBL47*	CBL.092.00			
COBOL043	IJSCBL48*	CBL.093.00			
COBOL044	IJSCBL49*	CBL.094.00			
COBOL050	IJSCBL50*	CBL.095.00			
COBOL055	IJSCBL55*	CBL.096.00			
DEBUG	IJSCBL60*	CBL.097.00			
None	IHD00000*	CBL.005.00			
None	IHD00100*	CBL.006.00			
None	IHD00200*	CBL.007.00			
None	IHD00300*	CBL.008.00			
None	IHD00400*	CBL.009.00			
None	IHD00500*	CBL.010.00			
None	IHD00600*	CBL.011.00			
None	IHD00700*	CBL.012.00			
None	IHD00800*	CBL.013.00			
None	IHD00900*	CBL.014.00			
None	IHD01000*	CBL.015.00			
None	IHD01100*	CBL.016.00			

COBOL LANGUAGE CONVERSION PROGRAM

<u>Core Image</u>	<u>Relocatable</u>	
<u>Phase Name</u>	<u>Module Name</u>	<u>Card ID</u>
LCPC	IKLDAA*	CVL.026.00
LCPC	IDKD0A*	CVL.029.00
LCPCOBDK	IKLDAB*	CVL.027.00
LCPCOBDK	IKLD0B*	CVL.030.00
LCPCOBDK	IKLD1A*	CVL.031.00
LCPCOBTP	IKLDAC*	CVL.028.00
LCPCOBTP	IKLD0B*	CVL.030.00
LCPCOBTP	ILKD1A*	CVL.031.00
LCPCOB21	IKLB0C*	CVL.001.00
LCPCOB21	IKLB0D*	CVL.002.00
LCPCOB11	IKLB1B*	CVL.003.00
LCPCOB11	IKLB11*	CVL.004.00
LCPCOB12	IKLB12*	CVL.005.00
LCPCOB13	IKLB13*	CVL.006.00
LCPCOB21	IKLB21*	CVL.007.00
LCPCOB22	IKLB22*	CVL.008.00
LCPCOB23	IKLB23*	CVL.009.00
LCPCOB24	IKLB24*	CVL.010.00
LCPCOB31	IKLB31*	CVL.011.00
LCPCOB32	IKLB32*	CVL.012.00
LCPCOB33	IKLB33*	CVL.013.00
LCPCOB34	IKLB34*	CVL.014.00
LCPCOB35	IKLB35*	CVL.015.00
LCPCOB36	IKLB36*	CVL.016.00
LCPCOB37	IKLB37*	CVL.017.00
LCPCOB41	IKLB4B*	CVL.018.00
LCPCOB4C	IKLB4C*	CVL.019.00

*Used as the microfiche card label.

LCPCOB4D	IKLB4D*	CVL.020.00	None	ILBDIFB0*	CBS.048.00
LCPCOB4E	IKLB4E*	CVL.021.00	None	ILBDIFD0*	CBS.049.00
LCPCOB4F	IKLB4F*	CVL.022.00	None	ILBDIML0*	CBS.050.00
LCPCOB4G	IKLB4G*	CVL.023.00	None	ILBDISE0*	CBS.051.00
LCPCOB41	IKLD4A*	CVL.032.00	None	ILBDISM0*	CBS.052.00
LCPCOB42	IKLB41*	CVL.024.00	None	ILBDITB0*	CBS.053.00
LCPCOB43	IKLB42*	CVL.025.00	None	ILBDIVL0*	CBS.054.00

COBOL F

<u>Core Image</u>	<u>Relocatable</u>	<u>Card ID</u>
<u>Phase Name</u>	<u>Module Name</u>	<u>Card ID</u>
\$\$BCOBER*	None	CBS.001.00
\$\$BCOBR1*	None	CBS.001.50
\$\$BFCMUL*	None	CBS.002.00

FCOBOL	ILACBL00*	CBS.003.00
FCOBOL	ILACBL01*	CBS.004.00
FCOBOL	ILACBL10*	CBS.005.00
FCOBOL11	ILACBL11*	CBS.006.00
FCOBOL12	ILACBL12*	CBS.007.00
FCOBOL20	ILACBL20*	CBS.008.00
FCOBOL21	ILACBL21*	CBS.009.00
FCOBOL22	ILACBL22*	CBS.010.00
FCOBOL30	ILACBL30*	CBS.011.00
FCOBOL40	ILACBL40*	CBS.012.00
FCOBOL50	ILACBL50*	CBS.013.00
FCOBOL51	ILACBL51*	CBS.014.00
FCOBOL60	ILACBL60*	CBS.015.00
FCOBOL61	ILACBL61*	CBS.016.00
FCOBOL70	ILACBL70*	CBS.017.00

None	ILBDABX0*	CBS.018.00
None	ILBDACP0*	CBS.019.00
None	ILBDANE0*	CBS.020.00
None	ILBDANF0*	CBS.021.00
None	ILBDASY0*	CBS.022.00
None	ILBDATB0*	CBS.023.00
None	ILBDBID0*	CBS.024.00
None	ILBDBIE0*	CBS.025.00
None	ILBDBII0*	CBS.026.00
None	ILBDCKP0*	CBS.028.00
None	ILBDCLK0*	CBS.029.00
None	ILBDCLS0*	CBS.030.00
None	ILBDCRD0*	CBS.032.00
None	ILBDDE0*	CBS.033.00
None	ILBDDCI0*	CBS.034.00
None	ILBDDIO0*	CBS.035.00
None	ILBDDSP0*	CBS.036.00
None	ILBDDSR0*	CBS.037.00
None	ILBDDUM0*	CBS.038.00
None	ILBDEFLO*	CBS.039.00
None	ILBDETBO*	CBS.040.00
None	ILBDFMT0*	CBS.041.00
None	ILBDFPW0*	CBS.042.00
None	ILBDGPW0*	CBS.043.00
None	ILBDIDA0*	CBS.044.00
None	ILBDIDB0*	CBS.045.00
None	ILBDIDR0*	CBS.046.00
None	ILBDIDT0*	CBS.047.00

None	ILBDIFB0*	CBS.048.00
None	ILBDIFD0*	CBS.049.00
None	ILBDIML0*	CBS.050.00
None	ILBDISE0*	CBS.051.00
None	ILBDISM0*	CBS.052.00
None	ILBDITB0*	CBS.053.00
None	ILBDIVL0*	CBS.054.00
None	ILBDMFT0*	CBS.055.00
None	ILBDMNS0*	CBS.056.00
None	ILBDMOV0*	CBS.057.00
None	ILBDMVE0*	CBS.058.00
None	ILBDNSL0*	CBS.059.00
None	ILBDOSY0*	CBS.060.00
None	ILBDRCR0*	CBS.060.50
None	ILBDRDIO*	CBS.060.60
None	ILBDRDS0*	CBS.060.70
None	ILBDRFM0*	CBS.060.80
None	ILBDSAE0*	CBS.061.00
None	ILBDSCHO*	CBS.062.00
None	ILBDSEMO*	CBS.063.00
None	ILBDSET0*	CBS.063.50
None	ILBDSPA0*	CBS.064.00
None	ILBDSRT0*	CBS.065.00
None	ILBDSTIO*	CBS.066.00
None	ILBDTEFO*	CBS.067.00
None	ILBDTOD0*	CBS.068.00
None	ILBDTRNO*	CBS.069.00
None	ILBDUPS0*	CBS.070.00
None	ILBDUSL0*	CBS.071.00
None	ILBDUTB0*	CBS.072.00
None	ILBDVBL0*	CBS.073.00
None	ILBDVCO0*	CBS.074.00
None	ILBDVMO0*	CBS.075.00
None	ILBDVTR0*	CBS.076.00
None	ILBDWTB0*	CBS.077.00
None	ILBDXDIO*	CBS.078.00
None	ILBDXMU0*	CBS.079.00
None	ILBDXPRO*	CBS.080.00
None	ILBDXTN0*	CBS.081.00

COBOL DASD MACROS

<u>Macro Name</u>	<u>Row</u>	<u>Card ID</u>
LOADA	A	468.001.00
LODIS	B	468.001.00
RANDA	C	468.001.00
RRUIS	D	468.001.00
RUADA	E	468.001.00
RUAIS	A	468.002.00
SEQDA	B	468.002.00
SRUIS	C	468.002.00

*Used as the microfiche card label.

FORTRAN IV (BASIC)

FFORT5 ILFEXT* FOF.006.00
 FFORT9 ILFROL* FOF.022.00

Core Image Relocatable
Phase Name Module Name Card ID

FORTRAN IJTFO1* FOR.016.00
 FORTREL IJTFO2* FOR.017.00
 FORTRGE IJTFO3* FOR.018.00
 FORTRPU IJTFO4* FOR.019.00

FORTRAN IV LIBRARY SUBPROGRAMS

Core Image Relocatable
Phase Name Module Name Card ID

None IJTAAFR* FOR.001.00
 None IJTACOM* FOR.002.00
 None IJTACON* FOR.003.00
 None IJTADIR* FOR.004.00
 None IJTADXD* FOR.005.00
 None IJTADXI* FOR.006.00
 None IJTAIXI* FOR.007.00
 None IJTAPST* FOR.008.00
 None IJTARBE* FOR.009.00
 None IJTARXI* FOR.010.00
 None IJTARXR* FOR.011.00
 None IJTADVCK* FOR.012.00
 None IJTEXPN* FOR.013.00
 None IJTDFMP* FOR.014.00
 None IJTFIOS* FOR.015.00
 None IJTFXIT* FOR.020.00
 None IJTTHXC* FOR.021.00
 None IJTIFIX* FOR.022.00
 None IJTLEXP* FOR.023.00
 None IJTLLLOG* FOR.024.00
 None IJTLLSCN* FOR.025.00
 None IJTLLSQT* FOR.026.00
 None IJTLLTAN* FOR.027.00
 None IJTLLTNH* FOR.028.00
 None IJTMAXD* FOR.029.00
 None IJTMODI* FOR.030.00
 None IJTMODR* FOR.031.00
 None IJTOVRF* FOR.032.00
 None IJTSINT* FOR.033.00
 None IJTSLIT* FOR.034.00
 None IJTSLOG* FOR.035.00
 None IJTSMX0* FOR.036.00
 None IJTSMX1* FOR.037.00
 None IJTSSCN* FOR.038.00
 None IJTSSQT* FOR.039.00
 None IJTSTAN* FOR.040.00
 None IJTSTNH* FOR.041.00

FFORTRBK ILFTRBK* LMF.045.00

None ILFACOM* LMF.000.50
 None ILFADCON* LMF.000.60
 None ILFCLABS* LMF.001.00
 None ILFCLAS* LMF.002.00
 None ILFCLEXP* LMF.003.00
 None ILFCLLOG* LMF.004.00
 None ILFCLSCN* LMF.005.00
 None ILFCLSQT* LMF.006.00
 None ILFCSABS* LMF.007.00
 None ILFCSAS* LMF.008.00
 None ILFCSEXP* LMF.009.00
 None ILFCSLOG* LMF.010.00
 None ILFCSSCN* LMF.011.00
 None ILFCSSQT* LMF.012.00
 None ILFDEBUG* LMF.012.50
 None ILFDIOCS* LMF.012.60
 None ILFFCDXI* LMF.013.00
 None ILFFCXPI* LMF.014.00
 None ILFFDUMP* LMF.014.50
 None ILFFDVCH* LMF.014.60
 None ILFFDXPD* LMF.015.00
 None ILFFDXPI* LMF.016.00
 None ILFFEXIT* LMF.016.50
 None ILFFINT* LMF.016.60
 None ILFFIOCS* LMF.016.70
 None ILFFIXPI* LMF.017.00
 None ILFFMAXD* LMF.018.00
 None ILFFMAXI* LMF.019.00
 None ILFFMAXR* LMF.020.00
 None ILFFOVER* LMF.020.50
 None ILFFRXPI* LMF.021.00
 None ILFFRXPR* LMF.022.00
 None ILFFSLIT* LMF.022.50
 None ILFGHTAB* LMF.022.60
 None ILFIBCOM* LMF.022.70
 None ILFIBERR* LMF.022.80
 None ILFLASCN* LMF.023.00
 None ILFLATN2* LMF.024.00
 None ILFLERF* LMF.025.00
 None ILFLEXP* LMF.026.00
 None ILFLGAMA* LMF.027.00
 None ILFLLOG* LMF.028.00
 None ILFLSCN* LMF.029.00
 None ILFLSCNH* LMF.030.00
 None ILFLSQRT* LMF.031.00
 None ILFLTANH* LMF.032.00
 None ILFLTANCT* LMF.033.00
 None ILFNAMEL* LMF.033.50
 None ILFSASCN* LMF.034.00
 None ILFSATN2* LMF.035.00
 None ILFSERF* LMF.036.00
 None ILFSEXP* LMF.037.00

FORTRAN IV

Core Image Relocatable
Phase Name Module Name Card ID

FFORTRAN ILFFORT* FOF.013.00
 FFORT1 ILFFPAR* FOF.021.00
 FFORT2 ILFALL* FOF.003.00
 FFORT3 ILFUNF* FOF.024.00
 FFORT4 ILFGEN* FOF.016.00

 *Used as the microfiche card label.

None	ILFSGAMA*	LMF.038.00
None	ILFSLOG*	LMF.039.00
None	ILFSSCN*	LMF.040.00
None	ILFSSCNH*	LMF.041.00
None	ILFSSQRT*	LMF.042.00
None	ILFSTANH*	LMF.043.00
None	ILFSTNCT*	LMF.044.00
None	ILFUNTAB*	LMF.046.00

PL/IC34A	IJXC34A*	PLI.110.70
PL/IC34B	IJXC34B*	PLI.110.75
PL/IC35	IJXC35*	PLI.111.00
PL/IC37	IJXC37*	PLI.111.60
PL/IC40	IJXC40*	PLI.111.70
PL/IC50	IJXC50*	PLI.112.00
PL/IC55	IJXC55*	PLI.113.00
PL/IC60	IJXC60*	PLI.114.00
PL/IC65	IJXC65*	PLI.115.00
PL/IC85	IJXC85*	PLI.116.00
PL/IC86	IJXC86*	PLI.117.00
PL/IC95	IJXC95*	PLI.118.00
PL/ID00	IJXD00*	PLI.119.00
PL/ID03	IJXD03*	PLI.119.60
PL/ID05	IJXD05*	PLI.120.00
PL/ID10	IJXD10*	PLI.121.00
PL/ID11	IJXD11*	PLI.122.00
PL/ID12	IJXD12*	PLI.122.50
PL/ID15	IJXD15*	PLI.123.00
PL/ID17	IJXD17*	PLI.124.00
PL/ID20	IJXD20*	PLI.125.00
PL/ID20A	IJXD20A*	PLI.125.50
PL/ID40	IJXD40*	PLI.126.00
PL/ID70	IJXD70*	PLI.127.00
PL/ID75	IJXD75*	PLI.128.00
PL/ID80	IJXD80*	PLI.129.00
PL/IE25	IJXE25*	PLI.130.00
PL/IE25A	IJXE25A*	PLI.131.00
PL/IE25B	IJXE25B*	PLI.132.00
PL/IE25C	IJXE25C*	PLI.133.00
PL/IE25D	IJXE25D*	PLI.134.00
PL/IE25E	IJXE25E*	PLI.135.00
PL/IE25F	IJXE25F*	PLI.136.00
PL/IE25G	IJXE25G*	PLI.137.00
PL/IE25H	IJXE25H*	PLI.138.00
PL/IE25I	IJXE25I*	PLI.139.00
PL/IE25J	IJXE25J*	PLI.140.00
PL/IE25K	IJXE25K*	PLI.140.50
PL/IE50	IJXE50*	PLI.141.00
PL/IE55	IJXE55*	PLI.141.50
PL/IE60	IJXE60*	PLI.142.00
PL/IE61	IJXE61*	PLI.143.00
PL/IF25	IJXF25*	PLI.144.00
PL/IF35	IJXF35*	PLI.145.00
PL/IF50	IJXF50*	PLI.145.50
PL/IF75	IJXF75*	PLI.146.00
PL/IF90	IJXF90*	PLI.147.00
PL/IF95	IJXF95*	PLI.148.00
PL/IG00	IJXG00*	PLI.149.00
PL/IG01	IJXG01*	PLI.150.00
PL/IG15	IJXG15*	PLI.151.00
PL/IG16	IJXG16*	PLI.151.50
PL/IG17	IJXG17*	PLI.152.00
PL/IG17B	IJXG17B*	PLI.153.00
PL/IG17D	IJXG17D*	PLI.154.00
PL/IG17E	IJXG17E*	PLI.155.00
PL/IG17R	IJXG17R*	PLI.156.00
PL/IG17S	IJXG17S*	PLI.157.00
PL/IG17X	IJXG17X*	PLI.157.50
PL/IG17Y	IJXG17Y*	PLI.157.75
PL/IG20	IJXG20*	PLI.158.00
PL/IG25	IJXG25*	PLI.159.00
PL/IG30	IJXG30*	PLI.160.00
PL/IG31	IJXG31*	PLI.161.00
PL/IG40	IJXG40*	PLI.162.00
PL/IG55	IJXG55*	PLI.163.00

PL/I (D)

<u>Core Image</u>	<u>Relocatable</u>	
<u>Phase Name</u>	<u>Module Name</u>	<u>Card ID</u>
\$\$BPLOSE	IJXPLOSE*	PLI.164.00
\$IJKS00	IJXS00*	PLI.167.00
\$IJKS10	IJXS10*	PLI.168.00
\$IJKS20	IJXS20*	PLI.169.00
\$IJKS30	IJXS30*	PLI.170.00
\$IJKS40	IJXS40*	PLI.171.00
\$IJKS50	IJXS50*	PLI.172.00
\$IJKS60	IJXS60*	PLI.173.00
\$IJKS70	IJXS70*	PLI.174.00
PL/IA00	IJXA00*	PLI.085.00
PL/IA00D	IJXA00D*	PLI.086.00
PL/IA10	IJXA10*	PLI.087.00
PL/IA20	IJXA20*	PLI.087.50
PL/IA25	IJXA25*	PLI.088.00
PL/IA27	IJXA27*	PLI.088.60
PL/IA30	IJXA30*	PLI.089.00
PL/IA35	IJXA35*	PLI.090.00
PL/IA45	IJXA45*	PLI.091.00
PL/IA50	IJXA50*	PLI.092.00
PL/IA60	IJXA60*	PLI.093.00
PL/IA65	IJXA65*	PLI.094.00
PL/IB10	IJXB10*	PLI.095.00
PL/IB15	IJXB15*	PLI.096.00
PL/IB20	IJXB20*	PLI.097.00
PL/IB25	IJXB25*	PLI.098.00
PL/IB30	IJXB30*	PLI.099.00
PL/IB40	IJXB40*	PLI.100.00
PL/IB70	IJXB70*	PLI.101.00
PL/IB75	IJXB75*	PLI.102.00
PL/IB80	IJXB80*	PLI.103.00
PL/IB85	IJXB85*	PLI.103.70
PL/IB87	IJXB87*	PLI.103.80
PL/IB90	IJXB90*	PLI.104.00
PL/IB92	IJXB92*	PLI.105.00
PL/IB95	IJXB95*	PLI.106.00
PL/IB97	IJXB97*	PLI.107.00
PL/IC00	IJXC00*	PLI.108.00
PL/IC03	IJXC03*	PLI.108.60
PL/IC25	IJXC25*	PLI.109.00
PL/IC30	IJXC30*	PLI.110.00
PL/IC31	IJXC31*	PLI.110.50
PL/IC32	IJXC32*	PLI.110.55
PL/IC33	IJXC33*	PLI.110.60
PL/IC34	IJXC34*	PLI.110.65

 *Used as the microfiche card label.

None	IJKEXHC*	PLI.000.50	None	IJKTPSM*	PLI.060.00
None	IJKQALM*	PLI.001.00	None	IJKTRGM*	PLI.061.00
None	IJKQASM*	PLI.002.00	None	IJKTRGZ*	PLI.061.25
None	IJKQBLA*	PLI.003.00	None	IJKTSIM*	PLI.061.50
None	IJKQBSA*	PLI.004.00	None	IJKTSTM*	PLI.062.00
None	IJKQCLA*	PLI.005.00	None	IJKTRON*	PLI.062.50
None	IJKQCSA*	PLI.006.00	None	IJKTXCF*	PLI.063.00
None	IJKQDLA*	PLI.007.00	None	IJKTXRM*	PLI.064.00
None	IJKQDSA*	PLI.008.00	None	IJKTXRN*	PLI.064.50
None	IJKQLLA*	PLI.009.00	None	IJKVBCM*	PLI.065.00
None	IJKQLSA*	PLI.010.00	None	IJKVBTM*	PLI.066.00
None	IJKQNLD*	PLI.011.00	None	IJKVCBM*	PLI.067.00
None	IJKQNSD*	PLI.012.00	None	IJKVCEM*	PLI.068.00
None	IJKQQLM*	PLI.013.00	None	IJKVCFM*	PLI.069.00
None	IJKQQSM*	PLI.014.00	None	IJKVCPM*	PLI.070.00
None	IJKQRLB*	PLI.015.00	None	IJKVCTM*	PLI.071.00
None	IJKQRSB*	PLI.016.00	None	IJKVECM*	PLI.072.00
None	IJKQSLD*	PLI.017.00	None	IJKVFCM*	PLI.073.00
None	IJKQSSD*	PLI.018.00	None	IJKVGIM*	PLI.074.00
None	IJKQTLB*	PLI.019.00	None	IJKVIGM*	PLI.075.00
None	IJKQTSB*	PLI.020.00	None	IJKVIIM*	PLI.076.00
None	IJKRBBM*	PLI.021.00	None	IJKVNPM*	PLI.077.00
None	IJKRBIM*	PLI.022.00	None	IJKVPCM*	PLI.078.00
None	IJKRBKA*	PLI.023.00	None	IJKVPNM*	PLI.079.00
None	IJKREBM*	PLI.024.00	None	IJKVPRM*	PLI.080.00
None	IJKRELM*	PLI.025.00	None	IJKVRPM*	PLI.081.00
None	IJKREPM*	PLI.026.00	None	IJKVTBM*	PLI.082.00
None	IJKRESM*	PLI.027.00	None	IJKVTCM*	PLI.083.00
None	IJKRGIM*	PLI.028.00	None	IJKXTBM*	PLI.084.00
None	IJKRGKM*	PLI.029.00	None	IJXSYSA*	PLI.165.00
None	IJKRMBX*	PLI.030.00	None	IJXSYSI*	PLI.166.00
None	IJKRMLX*	PLI.031.00			
None	IJKRMPX*	PLI.032.00			
None	IJKRMSX*	PLI.033.00			
None	IJKRSBM*	PLI.034.00			
None	IJKRSLM*	PLI.035.00			
None	IJKRSPM*	PLI.036.00			
None	IJKRSSM*	PLI.037.00			
None	IJKRUBM*	PLI.038.00			
None	IJKRUPM*	PLI.039.00			
None	IJKRWBM*	PLI.040.00			
None	IJKRWLM*	PLI.041.00			
None	IJKRWPM*	PLI.042.00			
None	IJKRWSM*	PLI.043.00			
None	IJKRXLN*	PLI.044.00			
None	IJKRXSA*	PLI.045.00			
None	IJKSDMP*	PLI.046.00			
None	IJKSDTM*	PLI.047.00			
None	IJKSTMM*	PLI.048.00			
None	IJKSYSA*	PLI.049.00			
None	IJKSYSI*	PLI.050.00			
None	IJKSZBA*	PLI.050.50			
None	IJKSZCA*	PLI.051.00			
None	IJKSZLM*	PLI.052.00			
None	IJKTCBM*	PLI.053.00			
None	IJKTCUM*	PLI.054.00			
None	IJKTDIM*	PLI.054.50			
None	IJKTDPD*	PLI.055.00			
None	IJKTFDM*	PLI.056.00			
None	IJKTFMM*	PLI.057.00			
None	IJKTGDI*	PLI.058.00			
None	IJKTLCM*	PLI.059.00			
None	IJKTLIM*	PLI.059.55			
None	IJKTLOM*	PLI.059.60			
None	IJKTLTB*	PLI.059.65			

REPORT PROGRAM GENERATOR (RPG)

<u>Core Image</u>	<u>Relocatable</u>	
<u>Phase Name</u>	<u>Module Name</u>	<u>Card ID</u>
RPG10010	IJR010*	RG.002.00
RPG10020	IJR020*	RG.003.00
RPG10025	IJR025*	RG.004.00
RPG10030	IJR030*	RG.005.00
RPG10030	IJR039*	RG.006.00
RPG10040	IJR040*	RG.007.00
RPG10040	IJR049*	RG.008.00
RPG10050	IJR050*	RG.009.00
RPG10050	IJR059*	RG.010.00
RPG10060	IJR060*	RG.011.00
RPG10060	IJR069*	RG.012.00
RPG10070	IJR070*	RG.013.00
RPG10070	IJR079*	RG.014.00
RPG10080	IJR080*	RG.015.00
RPG10080	IJR089*	RG.016.00
RPG10090	IJR090*	RG.017.00
RPG10090	IJR099*	RG.018.00
RPG10100	IJR100*	RG.019.00
RPG10100	IJR109*	RG.020.00
RPG10110	IJR110*	RG.021.00
RPG10110	IJR119*	RG.022.00
RPG10120	IJR120*	RG.023.00
RPG10120	IJR129*	RG.024.00
RPG10130	IJR130*	RG.025.00
RPG10130	IJR139*	RG.026.00
RPG10140	IJR140*	RG.027.00
RPG10140	IJR149*	RG.028.00

*Used as the microfiche card label.

RPG10150	IJR150*	RG.029.00
RPG10150	IJR159*	RG.030.00
RPG10160	IJR160*	RG.031.00
RPG10160	IJR169*	RG.032.00
RPG10170	IJR170*	RG.033.00
RPG10170	IJR179*	RG.034.00
RPG1018A	IJR18A*	RG.035.00
RPG1018A	IJR18F*	RG.036.00
RPG1018G	IJR18G*	RG.036.50
RPG1018G	IJR18H*	RG.036.75
RPG10180	IJR180*	RG.037.00
RPG10180	IJR189*	RG.038.00
RPG10190	IJR190*	RG.039.00
RPG10190	IJR199*	RG.040.00
RPG10200	IJR200*	RG.041.00
RPG10200	IJR209*	RG.042.00
RPG10210	IJR210*	RG.043.00
RPG10210	IJR219*	RG.044.00
RPG10220	IJR220*	RG.045.00
RPG10220	IJR229*	RG.046.00
RPG10230	IJR230*	RG.047.00
RPG10230	IJR239*	RG.048.00
RPG10240	IJR240*	RG.049.00
RPG10240	IJR241*	RG.050.00
RPG10240	IJR242*	RG.051.00
RPG10240	IJR243*	RG.052.00
RPG10240	IJR244*	RG.053.00
RPG10240	IJR245*	RG.054.00
RPG10240	IJR246*	RG.055.00
RPG10240	IJR247*	RG.056.00
RPG10240	IJR249*	RG.057.00
None	IJR000*	RG.001.00

IJZADO00	IJZADO00*	DN1.011.00
IJZADO01	IJZADO01*	DN1.012.00
IJZADO02	IJZADO02*	DN1.013.00
IJZADO03	IJZADO03*	DN1.014.00
IJZADO07	IJZADO07*	DN1.015.00
IJZADO10	IJZADO10*	DN1.015.50
IJZADO11	IJZADO11*	DN1.015.75
IJZADO16	IJZADO16*	DN1.016.00
IJZADO21	IJZADO21*	DN1.017.00
IJZADO22	IJZADO22*	DN1.018.00
IJZADO24	IJZADO24*	DN1.019.00
IJZADO26	IJZADO26*	DN1.020.00
IJZADO28	IJZADO28*	DN1.021.00
IJZADO31	IJZADO31*	DN1.022.00
IJZADO32	IJZADO32*	DN1.023.00
IJZADO33	IJZADO33*	DN1.024.00
IJZADO35	IJZADO35*	DN1.025.00
IJZADO36	IJZADO36*	DN1.026.00
IJZADO37	IJZADO37*	DN1.027.00
IJZADO39	IJZADO39*	DN1.028.00
IJZADO40	IJZADO40*	DN1.029.00
IJZADO41	IJZADO41*	DN1.030.00
IJZADO42	IJZADO42*	DN1.031.00
IJZADO43	IJZADO43*	DN1.032.00
IJZADO44	IJZADO44*	DN1.033.00
IJZADO47	IJZADO47*	DN1.034.00
IJZADO52	IJZADO52*	DN1.035.00
IJZADO56	IJZADO56*	DN1.036.00
IJZADO57	IJZADO57*	DN1.037.00
IJZADO60	IJZADO60*	DN1.038.00
IJZADO61	IJZADO61*	DN1.039.00
IJZADO62	IJZADO62*	DN1.040.00
IJZADO63	IJZADO63*	DN1.041.00
IJZADO64	IJZADO64*	DN1.042.00
IJZADO65	IJZADO65*	DN1.043.00
IJZADO70	IJZADO70*	DN1.044.00
IJZADO71	IJZADO71*	DN1.045.00
IJZADO72	IJZADO72*	DN1.046.00
IJZADO73	IJZADO73*	DN1.047.00
IJZADO76	IJZADO76*	DN1.047.50
IJZADO77	IJZADO77*	DN1.047.60
IJZADO78	IJZADO78*	DN1.047.70
IJZADO85	IJZADO85*	DN1.048.00
IJZADO94	IJZADO94*	DN1.049.00
IJZADO98	IJZADO98*	DN1.050.00
IJZADO99	IJZADO99*	DN1.050.50

OLTEP

<u>Core Image</u>	<u>Relocatable</u>	
<u>Phase Name</u>	<u>Module Name</u>	<u>Card ID</u>
\$\$BOLTEP	IJZAOLTP*	DN1.054.00
\$\$BSOPEN	IJZAOPEN*	DN1.055.00
\$\$BTOLTP	IJZATOLT*	DN1.059.50
\$\$BZTIME	IJZATIME*	DN1.059.00

IJZACEOM	IJZACEOM*	DN1.001.00
IJZACKTP	IJZACKTP*	DN1.002.00
IJZACMNT	IJZACMNT*	DN1.003.00
IJZACOMP	IJZACOMP*	DN1.004.00
IJZACONV	IJZACONV*	DN1.005.00
IJZADOAA	IJZADOAA*	DN1.007.00
IJZADOAB	IJZADOAB*	DN1.008.00
IJZADOAC	IJZADOAC*	DN1.009.00
IJZADOLT	IJZADOLT*	DN1.010.00
IJZADPRT	IJZADPRT*	DN1.051.00
IJZAEXIO	IJZAEXIO*	DN1.052.00
IJZAHEAD	IJZAHEAD*	DN1.053.00
IJZAOPUT	IJZAOPUT*	DN1.056.00
IJZARATA	IJZARATA*	DN1.057.00
IJZARSLT	IJZARSLT*	DN1.058.00
IJZAWAIT	IJZAWAIT*	DN1.060.00

MAGNETIC INK CHARACTER READER (MICR ERP)

<u>Core Image</u>	<u>Relocatable</u>	
<u>Phase Name</u>	<u>Module Name</u>	<u>Card ID</u>
\$\$ANERRT*	None	IOM.001.00
\$\$ANERRW*	None	IOM.002.00
\$\$BCMR01*	None	IOM.003.00
\$\$BMMR20*	None	IOM.004.00
\$\$BOMR01*	None	IOM.005.00

*Used as the microfiche card label.

Macro Name	Row	Card ID
DISEN	A	477.001.00
DTFMR	B	477.001.00
LITE	C	477.001.00
MRMOD	D	477.001.00
SMICR	A, B	477.002.00

OPTICAL CHARACTER READER (ORERP)

Core Image	Relocatable	Phase Name	Module Name	Card ID
\$\$\$ANERR9*	None			IOR.001.00
\$\$\$BOOR01*	None			ICR.002.00

INDEX-SEQUENTIAL FILE MANAGEMENT SYSTEM

Core Image	Relocatable	Phase Name	Module Name	Card ID
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\$\$\$BENDFF*	None			IOL.001.00
\$\$\$BENDFL*	None			IOL.002.00
\$\$\$BINDEX*	None			IOL.003.00
\$\$\$BORTV1*	None			IOL.008.00
\$\$\$BORTV2*	None			IOL.009.00
\$\$\$BSETFF*	None			IOL.004.00
\$\$\$BSETFG*	None			IOL.005.00
\$\$\$BSETFH*	None			IOL.005.50
\$\$\$BSETFL*	None			IOL.006.00
\$\$\$BSETL*	None			IOL.007.00
\$\$\$BSETL1*	None			IOL.007.50

Macro Name	Row	Card ID
DSPLY	A	478.001.00
DTFOR	B	478.001.00
ORMOD	A-C	478.002.00
RDLNE	C	478.001.00
RESCN	D	478.001.00

SORT/MERGE (DISK)

Core Image	Relocatable	Phase Name	Module Name	Card ID
DSORT			IJOSM001*	SMB.001.00
DSORT002			IJOSM002*	SMB.002.00
DSORT003			IJOSM003*	SMB.003.00
DSORT004			IJOSM004*	SMB.004.00

*Used as the microfiche card label.

DSORT005	IJOSM005*	SMB.005.00
DSORT006	IJOSM006*	SMB.006.00
DSORT007	IJOSM007*	SMB.007.00
DSORT008	IJOSM008*	SMB.008.00
DSORT009	IJOSM009*	SMB.009.00
DSORT010	IJOSM010*	SMB.010.00
DSORT101	IJOSM101*	SMB.011.00
DSORT102	IJOSM102*	SMB.012.00
DSORT103	IJOSM103*	SMB.013.00
DSORT104	IJOSM104*	SMB.014.00
DSORT105	IJOSM105*	SMB.015.00
DSORT201	IJOSM201*	SMB.016.00
DSORT202	IJOSM202*	SMB.017.00
DSORT203	IJOSM203*	SMB.018.00
DSORT204	IJOSM204*	SMB.019.00
DSORT301	IJOSM301*	SMB.020.00
DSORT302	IJOSM302*	SMB.021.00
DSORT303	IJOSM303*	SMB.022.00
DSORT304	IJOSM304*	SMB.023.00
DSORT401	IJOSM401*	SMB.024.00
DSORT402	IJOSM402*	SMB.025.00
DSORT501	IJOSM501*	SMB.026.00

SORT/MERGE (DISK/TAPE)

Core Image	Relocatable	Phase Name	Module Name	Card ID
SORT			ILHSPPI*	SMC.022.00
SORT			ILHSRTMG*	SMC.073.00
SORTASA			ILHSASA*	SMC.017.00
SORTAA			ILHSRAA*	SMC.023.00
SORTRAB			ILHSRAB*	SMC.024.00
SORTRAC			ILHSAAC*	SMC.001.00
SORTRAC			ILHSAGD*	SMC.005.00
SORTRAC			ILHSAPC*	SMC.012.00
SORTRAC			ILHSASG*	SMC.019.00
SORTRAC			ILHSRAC*	SMC.025.00
SORTRAC			ILHSRGD*	SMC.051.00
SORTRAC			ILHSRPC*	SMC.062.00
SORTRAD			ILHSAAD*	SMC.002.00
SORTRAD			ILHSAGE*	SMC.006.00
SORTRAD			ILHSAPD*	SMC.013.00
SORTRAD			ILHSASG*	SMC.019.00
SORTRAD			ILHSRAD*	SMC.026.00
SORTRAD			ILHSRGE*	SMC.052.00
SORTRAD			ILHSRPD*	SMC.063.00
SORTRBA			ILHSRBA*	SMC.027.00
SORTRBB			ILHSRBB*	SMC.028.00
SORTRBC			ILHSRBC*	SMC.029.00
SORTRBD			ILHSRBD*	SMC.030.00
SORTRBF			ILHSRBF*	SMC.031.00
SORTRCB			ILHSRCB*	SMC.034.00
SORTRCC			ILHSRCC*	SMC.035.00
SORTRCD			ILHSRCD*	SMC.036.00
SORTRCE			ILHSRCE*	SMC.037.00
SORTRCF			ILHSRCF*	SMC.038.00
SORTRCH			ILHSRCH*	SMC.039.00
SORTRCJ			ILHSRCJ*	SMC.040.00
SORTRCJ			ILHSRCJ*	SMC.041.00
SORTRCK			ILHSRCK*	SMC.042.00
SORTRCL			ILHSRBG*	SMC.032.00
SORTRCL			ILHSRCA*	SMC.033.00

SORTRCL	ILHSRCL*	SMC.043.00	(TSRTP001)		
SORTRCM	ILHSRCM*	SMC.044.00	TSRTP007	IJPSM001	SMA.001.00
SORTRCN	ILHSRCN*	SMC.045.00	(TSRTP001)		
SORTRDA	ILHSRDA*	SMC.046.00	TSRTP008	IJPSM001	SMA.001.00
SORTRDB	ILHSRDB*	SMC.047.00	(TSRTP001)		
SORTRDC	ILHSRDC*	SMC.048.00	TSRTP101*	IJPSM002	SMA.002.00
SORTRGA	ILHSRGA*	SMC.049.00	TSRTP102	IJPSM002	SMA.002.00
SORTRGB	ILHSRGB*	SMC.050.00	(TSRTP101)		
SORTRGF	ILHSAGF*	SMC.007.00	TSRTP103	IJPSM002	SMA.002.00
SORTRGF	ILHSAPF*	SMC.014.00	(TSRTP101)		
SORTRGF	ILHSRGF*	SMC.053.00	TSRTP104	IJPSM002	SMA.002.00
SORTRGG	ILHSAGG*	SMC.008.00	(TSRTP101)		
SORTRGG	ILHSAPG*	SMC.015.00	TSRTP105	IJPSM002	SMA.002.00
SORTRGG	ILHSRGG*	SMC.054.00	(TSRTP101)		
SORTRGH	ILHSAGH*	SMC.009.00	TSRTP201*	IJPSM003	SMA.003.00
SORTRGH	ILHSAPH*	SMC.016.00	TSRTP202	IJPSM003	SMA.003.00
SORTRGH	ILHSRGH*	SMC.055.00	(TSRTP201)		
SORTROA	ILHSROA*	SMC.057.00	TSRTP203	IJPSM003	SMA.003.00
SORTROB	ILHSABF*	SMC.003.00	(TSRTP201)		
SORTROB	ILHSAOB*	SMC.010.00	TSRTP204	IJPSM003	SMA.003.00
SORTROB	ILHSASF*	SMC.018.00	(TSRTP201)		
SORTROB	ILHSROB*	SMC.058.00	TSRTP301*	IJPSM004	SMA.004.00
SORTROC	ILHSASL*	SMC.021.00	TSRTP302	IJPSM004	SMA.004.00
SORTROC	ILHSABG*	SMC.004.00	(TSRTP301)		
SORTROC	ILHSAOC*	SMC.011.00	TSRTP303	IJPSM004	SMA.004.00
SORTROC	ILHSASK*	SMC.020.00	(TSRTP301)		
SORTROC	ILHSRBG*	SMC.032.00			
SORTROC	ILHSROC*	SMC.059.00			
SORTROC	ILHSRPE*	SMC.064.00			
SORTRPA	ILHSRPA*	SMC.060.00			
SORTRPB	ILHSRPB*	SMC.061.00			
SORTRSD	ILHSRSD*	SMC.065.00			
SORTRSE	ILHSRMC*	SMC.056.00			
SORTRSE	ILHSRSE*	SMC.066.00			
SORTRSE	ILHSRSI*	SMC.069.00			
SORTRSG	ILHSRSG*	SMC.067.00			
SORTRSH	ILHSRSH*	SMC.068.00			
SORTRSJ	ILHSRMC*	SMC.056.00			
SORTRSJ	ILHSRSM*	SMC.071.00			
SORTRSJ	ILHSRSJ*	SMC.070.00			
SORTRSM	ILHSRMC*	SMC.056.00			
SORTRSM	ILHSRSM*	SMC.071.00			
SORTRSN	ILHSRMC*	SMC.056.00			
SORTRSN	ILHSRSN*	SMC.072.00			

UTILITIES GROUP 1 (UNIT RECORD AND DISK)

<u>Core Image</u>	<u>Relocatable</u>	<u>Card ID</u>
<u>Phase Name</u>	<u>Module Name</u>	
\$\$BLISTV	IJWLVT*	UT1.032.00
ATAD	IJWAD1*	UT1.001.00
ATAD2	IJWAD2*	UT1.002.00
ATAD3	IJWAD3*	UT1.003.00
ATAD4	IJWAD4*	UT1.004.00
ATAD5	IJWAD5*	UT1.004.50
CDDK	IJWCD1*	UT1.005.00
CDDK2	IJWCD3*	UT1.006.00
CDDK3	IJWCD4*	UT1.007.00
CDPP	IJWCP1*	UT1.011.00
CDPP2	IJWCP3*	UT1.012.00
CDPP3	IJWCP4*	UT1.013.00
CDTP1	IJWGEN*	UT1.023.00
CDTP4	IJWLAB*	UT1.030.00
CLRDSK	IJWCLD1*	UT1.008.00
CLRD2	IJWCLD2*	UT1.009.00
CLRD3	IJWCLD3*	UT1.010.00
CRCD	IJWRC1*	UT1.033.00
CRDC	IJWKC1*	UT1.028.00
CRDC2	IJWKC2*	UT1.029.00
CRDD	IJWRD1*	UT1.034.00
CRDD2	IJWRD2*	UT1.035.00
DCTP1	IJWGEN*	UT1.023.00
DCTP5	IJWLAB*	UT1.030.00
DKCD	IJWDC1*	UT1.014.00
DKCD2	IJWDC3*	UT1.015.00
DKCD3	IJWDC4*	UT1.016.00
DKDK	IJWDD1*	UT1.017.00
DKDK2	IJWDD3*	UT1.018.00

SORT/MERGE (TAPE)

<u>Core Image</u>	<u>Relocatable</u>	<u>Card ID</u>
<u>Phase Name</u>	<u>Module Name</u>	
TSRTP001*	IJPSM001	SMA.001.00
TSRTP002	IJPSM001	SMA.001.00
(TSRTP001)		
TSRTP003	IJPSM001	SMA.001.00
(TSRTP001)		
TSRTP004	IJPSM001	SMA.001.00
(TSRTP001)		
TSRTP005	IJPSM001	SMA.001.00
(TSRTP001)		
TSRTP006	IJPSM001	SMA.001.00

*Used as the microfiche card label.

DKDK3	IJWDD4*	UT1.019.00
DKPR	IJWDP1*	UT1.020.00
DKPR2	IJWDP3*	UT1.021.00
DKPR3	IJWDP4*	UT1.022.00
DKTP1	IJWGEN*	UT1.023.00
DKTP4	IJWLAB*	UT1.030.00
DKTP5	IJWLAB*	UT1.030.00

INTD	IJWID1*	UT1.024.00
INTD2	IJWID2*	UT1.025.00
INTD3	IJWID3*	UT1.026.00
INTD4	IJWID4*	UT1.027.00

LISTVTOC	IJWLV1*	UT1.031.00
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TPCD1	IJWGEN*	UT1.023.00
TPCD4	IJWLAB*	UT1.030.00
TPCD5	IJWLAB*	UT1.030.00
TPDK1	IJWGEN*	UT1.023.00
TPDK4	IJWLAB*	UT1.030.00
TPDK5	IJWLAB*	UT1.030.00
TPPR1	IJWGEN*	UT1.023.00
TPPR4	IJWLAB*	UT1.030.00
TPPR5	IJWLAB*	UT1.030.00
TPTP1	IJWGEN*	UT1.023.00
TPTP4	IJWLAB*	UT1.030.00
TPTP5	IJWLAB*	UT1.030.00

UTILITIES GROUP 2 (TAPE)

<u>Core Image</u>	<u>Relocatable</u>	
<u>Phase Name</u>	<u>Module Name</u>	<u>Card ID</u>

CDTP	IJWCT1*	UT2.001.00
CDTP2	IJWCT3*	UT2.002.00
CDTP3	IJWCT4*	UT2.003.00
CRDT	IJWKT1*	UT2.007.00
CRDT2	IJWKT2*	UT2.008.00
CRTD	IJWRT1*	UT2.010.00

DCTP	IJWMT1*	UT2.009.00
DKTP	IJWDT1*	UT2.004.00
DKTP2	IJWDT3*	UT2.005.00
DKTP3	IJWDT4*	UT2.006.00

INIT	IJWIT*	UT2.006.50
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TPCD	IJWTC1*	UT2.014.00
TPCD2	IJWTC3*	UT2.015.00
TPCD3	IJWTC4*	UT2.016.00
TPCP	IJWTCP*	UT2.011.00
TPCP2	IJWTCP2*	UT2.012.00
TPCP3	IJWTCP3*	UT2.013.00
TPDC	IJWTM1*	UT2.020.00
TPDK	IJWTD1*	UT2.017.00
TPDK2	IJWTD3*	UT2.018.00
TPDK3	IJWTD4*	UT2.019.00
TPPR	IJWTP1*	UT2.021.00
TPPR2	IJWTP3*	UT2.022.00
TPPR3	IJWTP4*	UT2.023.00

TPTP	IJWTT1*	UT2.024.00
TPTP2	IJWTT3*	UT2.025.00
TPTP3	IJWTT4*	UT2.026.00
None	IJWXIT*	UT2.027.00

UTILITIES GROUP 3 (DATA CELL)

<u>Core Image</u>	<u>Relocatable</u>	
<u>Phase Name</u>	<u>Module Name</u>	<u>Card ID</u>
ATAM	IJWAM1*	UT3.007.00
ATAM2	IJWAM2*	UT3.008.00
ATAM3	IJWAM3*	UT3.009.00
ATAM4	IJWAM4*	UT3.010.00
ATAM5	IJWAM5*	UT3.010.50
CLDC	IJWCLM1*	UT3.001.00
CLDC2	IJWGEN*	UT3.023.00
CLDC3	IJWDD3*	UT3.018.00
CLDC4	IJWDD4*	UT3.019.00
CLDC5	IJWLAB*	UT3.030.00

DCDC	IJWMM1*	UT3.004.00
DCDC2	IJWGEN*	UT3.023.00
DCDC3	IJWDD3*	UT3.018.00
DCDC4	IJWDD4*	UT3.019.00
DCDC5	IJWLAB*	UT3.030.00
DCDK	IJWMD1*	UT3.003.00
DCDK2	IJWGEN*	UT3.023.00
DCDK3	IJWDD3*	UT3.018.00
DCDK4	IJWDD4*	UT3.019.00
DCDK5	IJWLAB*	UT3.030.00
DCPR	IJWMP1*	UT3.005.00
DCPR2	IJWGEN*	UT3.023.00
DCPR3	IJWDD3*	UT3.018.00
DCPR4	IJWDD4*	UT3.019.00
DCPR5	IJWLAB*	UT3.030.00
DKDC	IJWDM1*	UT3.002.00
DKDC2	IJWGEN*	UT3.023.00
DKDC3	IJWDD3*	UT3.018.00
DKDC4	IJWDD4*	UT3.019.00
DKDC5	IJWLAB*	UT3.030.00

INTM	IJWIM1*	UT3.011.00
INTM2	IJWIM2*	UT3.012.00
INTM3	IJWIM3*	UT3.013.00
INTM4	IJWIM4*	UT3.014.00

UTILITIES - MPS

<u>Core Image</u>	<u>Relocatable</u>	
<u>Phase Name</u>	<u>Module Name</u>	<u>Card ID</u>
\$\$BMU100*	None	UT4.001.00
\$\$BMU200*	None	UT4.002.00
\$\$BMU300*	None	UT4.003.00

*Used as the microfiche card label.

Macro Name	Row	Card ID
INCARD	A	471.001.00
INDISK	B,C	471.001.00
INLOG	D	471.001.00
INTAPE	A,B	471.002.00
INTCR	A-C	471.004.00
OUTCARD	C	471.002.00
OUTDISK	D,E	471.002.00
OUTLOG	A	471.003.00
OUTPRT	B	471.003.00
OUTTAPE	C,D	471.003.00

UTILITIES - VOCABULARY FILE

Core Image Phase Name	Relocatable Module Name	Card ID
None	IJNVBL*	UT5.001.00
None	IJNVCT*	UT5.002.00
None	IJNVER*	UT5.003.00
None	IJNVIO*	UT5.004.00
None	IJNVLI*	UT5.005.00
None	IJNVLO*	UT5.006.00
None	IJNVUP*	UT5.007.00

EMULATOR - MOD 30

Macro Name	Row	Card ID
EU3CG	A	484.004.00
EU3DK	A	484.002.00
EU3EJ	C	484.004.00
EU3ER	D	484.004.00
EU3FT	E	484.004.00
EU3MS	A	484.005.00
EU3OS	A-D	484.003.00
EU3PH	B,C	484.005.00
EU3PT	D,E	484.005.00
EU3RD	A,B	484.006.00
EU3TP	C,D	484.006.00
EU30	A	484.001.00

EMULATOR - MOD 40

Macro Name	Row	Card ID
DIAG	A	485.001.00
EU4CG	B	485.001.00
EU4DK		485.006.00
EU4EJ	C	485.001.00
EU4ER	D	485.001.00
EU4FT	E	485.001.00
EU4IN	A,B	485.002.00
EU4MS	D	485.002.00
EU4OS	A-E	485.003.00

*Used as the microfiche card label.

EU4PH	A,B	485.004.00
EU4PT	C,D	485.004.00
EU4RD	A,B	485.005.00
EU4TP	C-E	485.005.00
EU40	A	485.007.00

EMULATOR - SYSTEM/370

Core Image Phase Name	Relocatable Module Name	Card ID
None	None	EU1.001.00
None	None	EU1.002.00
None	None	EU1.003.00
None	None	EU1.004.00
None	None	EU1.005.00
None	None	EU1.006.00
None	None	EU1.007.00
None	None	EU1.008.00
None	None	EU1.009.00
None	None	EU1.010.00
None	None	EU1.011.00
None	None	EU1.012.00
None	None	EU1.013.00
None	None	EU1.014.00
None	None	EU1.015.00
None	None	EU1.016.00
None	None	EU1.017.00
None	None	EU1.018.00
None	None	EU1.019.00
None	None	EU1.020.00
None	None	EU1.021.00
None	None	EU1.022.00
None	None	EU1.023.00
None	None	EU1.024.00
None	None	EU1.025.00
None	None	EU1.026.00
None	None	EU1.027.00
None	None	EU1.028.00
None	None	EU1.029.00
None	None	EU1.030.00
None	None	EU1.031.00
None	None	EU1.032.00
None	None	EU1.033.00
None	None	EU1.034.00
None	None	EU1.035.00
None	None	EU1.036.00
None	None	EU1.037.00

None	IIQAP*	EU1.038.00
None	IIQBF*	EU1.039.00
None	IIQBY*	EU1.040.00
None	IIQCC*	EU1.041.00
None	IIQCF*	EU1.042.00
None	IIQCN*	EU1.043.00
None	IIQCP*	EU1.044.00
None	IIQCS*	EU1.045.00
None	IIQDI*	EU1.046.00
None	IIQDK*	EU1.047.00
None	IIQDP*	EU1.048.00
None	IIQDJ*	EU1.049.00
None	IIQEP*	EU1.050.00
None	IIQMC*	EU1.051.00
None	IIQMD*	EU1.052.00

None	IIQMT*	EU1.053.00
None	IIQMTTP*	EU1.054.00
None	IIQMW*	EU1.055.00
None	IIQNT*	EU1.056.00
None	IIQOA*	EU1.057.00
None	IIQOB*	EU1.058.00
None	IIQPOST*	EU1.059.00
None	IIQPRE*	EU1.060.00
None	IIQSD*	EU1.061.00
None	IIQTP*	EU1.062.00
None	IIQVT*	EU1.063.00
None	IIRBF*	EU1.064.00
None	IIRCC*	EU1.065.00
None	IIRCP*	EU1.066.00
None	IIRDB*	EU1.067.00
None	IIRDK*	EU1.068.00
None	IIRDL*	EU1.069.00
None	IIRDS*	EU1.070.00
None	IIREJ*	EU1.071.00
None	IIRFP*	EU1.072.00
None	IIRIS*	EU1.073.00
None	IIRMI*	EU1.074.00
None	IIRMT*	EU1.075.00
None	IIRMTP*	EU1.076.00
None	IIRMW*	EU1.077.00
None	IIRNT*	EU1.078.00
None	IIROA*	EU1.079.00
None	IIROB*	EU1.080.00
None	IIRPOST*	EU1.081.00
None	IIRPR*	EU1.082.00
None	IIRPRE*	EU1.083.00
None	IIRSD*	EU1.084.00
None	IIRST*	EU1.085.00
None	IIRTP*	EU1.086.00
None	IIRUR*	EU1.087.00
None	IIRVT*	EU1.088.00

<u>Macro Name</u>	<u>Row</u>	<u>Card ID</u>
ANUM	A	490.001.00
BDIL	B	490.001.00
BIFLAG	C	490.001.00
COMP	D	490.001.00
DBIB	E	490.001.00
DDTF	A	490.002.00
DDUB	B	490.002.00
DECCB	C	490.002.00
DIIQCR	D, E	490.002.00
DIIRCR	A, B	490.003.00
DIL	C	490.003.00
DSUB	D	490.003.00
EMCNLS	E	490.003.00
EMDISK	A, B	490.004.00
EMEND	C-E	490.004.00
EMPNCH	A	490.005.00
EMPTR	B	490.005.00
EMRDR	C	490.005.00
EMSUP	D	490.005.00
EMTAPE	E	490.005.00
EMULATOR	A	490.006.00
EMVERIFY	B	490.006.00

*Used as the microfiche card label.

IIQBR	C, D	490.006.00
IIQCR	A-E	490.007.00
IIQDS	A-D	490.008.00
IIQEI	E	490.008.00
IIQID	A, B	490.009.00
IIQIU	A-E	490.010.00
IIQOJ	C, D	490.009.00
IIQUR	A-E	490.011.00
IIRCR	A-D	490.012.00
IIRDCC	E	490.012.00
IIREI	A	490.013.00
IIRID	B-D	490.013.00
IIRIU	A, B	490.014.00
IIROJ	C, D	490.014.00
MCPU	A	490.015.00
MIO	B	490.015.00

AUTOTEST

<u>Core Image</u>	<u>Relocatable</u>	<u>Card ID</u>
<u>Phase Name</u>	<u>Module Name</u>	
\$\$BATST1	IJVSS1*	PTD.002.00
\$\$BATST3	IJVSS3*	PTD.003.00
ATLECONT	IJVTA0*	PTD.005.00
ATLEDT	IJVLE*	PTD.001.00
ATLEDT1A	IJVLE*	PTD.001.00
ATLEDT1B	IJVLE*	PTD.001.00
ATLEDT10	IJVLE*	PTD.001.00
ATLEDT12	IJVLE*	PTD.001.00
ATLEDT14	IJVLE*	PTD.001.00
ATLEDT16	IJVLE*	PTD.001.00
ATLEDT18	IJVLE*	PTD.001.00
ATLEFC1	IJVTC1*	PTD.006.00
ATLEFC2	IJVTC2*	PTD.007.00
ATLEFC3	IJVTC3*	PTD.008.00
ATLEFC4	IJVTC4*	PTD.009.00
ATLEFC5	IJVTC5*	PTD.010.00
ATLEFC7	IJVTC7*	PTD.011.00
ATLEFD1	IJVTD1*	PTD.012.00
ATLEFD2	UJVTD2*	PTD.013.00
ATLEFE1	UJVTE1*	PTD.014.00
ATLEFE2	UJVTE2*	PTD.015.00
ATLEFF1	UJVTF1*	PTD.016.00
ATLEFG1	UJVTF1*	PTD.017.00
ATLEFH2	UJVTH2*	PTD.018.00
ATLEFH3	UJVTH3*	PTD.019.00
ATLEGO1	IJVTI1*	PTD.020.00
ATLEJCTV	IJVTI1*	PTD.021.00
None	IJVTA0*	PTD.004.00

DISTRIBUTION PROGRAM

No core image or relocatable name.
Microfiche label is DOSUT208.
ID card is AID.026.00.

APPENDIX C: MASTER INDEX FOR DOS SYSTEM CONTROL PLMS

For the purpose of this master index, each of the seven DOS System Control Program Logic Manuals has been assigned a key:

<u>KEY</u>	<u>PLM</u>
1	<u>Introduction to DOS Logic</u> , GY24-5017.
2	<u>DOS IPL and Job Control</u> , GY24-5086.
3	<u>DOS Supervisor and Related Transients</u> , GY24-5151.
4	<u>DOS Librarian</u> , GY24-5079.
5	<u>DOS Linkage Editor</u> , GY24-5080.
6	<u>DOS Logical Transients</u> , GY24-5152.
7	<u>DOS System Service Programs</u> , GY24-5153.

The key following each item in this index indicates the PLM in which the information is to be found. The page number for the item is in the index of the referenced manual.

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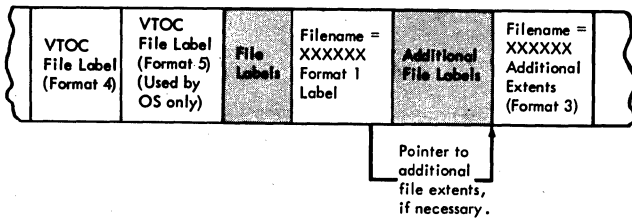
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APPENDIX D: VOLUME TABLE OF CONTENTS (VTOC)

All standard file labels are grouped together and stored in a specific area on a disk pack or data cell. This group of labels is essentially a directory of all data records on the volume because each file label contains file limits. Therefore, this group of labels is called the volume table of contents, or VTOC. Because the VTOC itself is a file of records containing one or more standard label records for each logical file, it is defined as such with its own file label (Figure 7).

The VTOC label is a format-4 label and is the first record on the VTOC. This label identifies the file as the VTOC and contains the file limits of the VTOC. When initializing a disk pack or a data cell, the location and length of the VTOC must be specified. These restrictions apply when the area is being assigned for the VTOC:

1. For the 2311, 2314, or 2319, it must be within cylinders 0-199. For the 2321, it must be within subcell 0, strip 0, cylinder 0 and subcell 19, strip 5, cylinder 4.
2. If the VTOC is to be located on the system residence pack (SYSRES), it must be outside the residence area.



For a more detailed description of the VTOC, see the DOS LIQCS publication listed in the Preface.

Figure 7. Volume Table of Contents (VTOC)

For a more complete list of data processing terms, refer to IBM Data Processing Techniques, a Data Processing Glossary, GC20-1699.

ASCII (American National Standard Code for Information Interchange): A 128-character, 7-bit code. The high-order bit in the IBM 8-bit environment is zero.

CCH (channel check handler): A feature that assesses System/370 channel errors to determine if the system can continue operations.

data set security: A feature that provides protection for disk files. A data secured file cannot be accidentally accessed by a problem program.

DOS (Disk Operating System): A disk resident system that provides operating system capabilities for 16K and larger IBM System/360 and System/370 systems.

DOS Volume Statistics: A facility that monitors and records the number of temporary read and write errors on currently accessed tape volumes. This facility has two options, Error Statistics by Tape Volume (ESTV) and Error Volume Analysis (EVA).

EREP (Environmental Recording, Editing, and Printing): A program that processes data contained on the system recorder file.

ESTV (Error Statistics by Tape Volume): One of the two options of the DOS Volume Statistics. With ESTV support, the system collects data on tape errors by volume for any tape volumes used by the system.

EVA (Error Volume Analysis): One of the two options of the DOS Volume Statistics. With this option, the system issues a message to the operator when a number of temporary read or write errors (specified by the user at system generation time) has been exceeded on a currently accessed tape volume.

F/L Trace (Fetch/Load Trace): A program that records information about phases and transients as they are called from the core image library.

GSVC Trace (Generalized Supervisor Calls Trace): A program that records SVC interrupts as they occur. All or a selected group of SVCs can be traced.

I/O (input/output) error logging: The process of recording OBR and SDR records on the system recorder file.

I/O Trace (Input/Output Trace): A program that records I/O device activity for all or a selected group of I/O devices.

IDRA (independent directory read-in area): A resident area created by a supervisor option into which the system reads core image library directories for fetch and load operations. Using IDRA frees the physical transient area to perform error recovery procedures.

job accounting interface: A function that accumulates accounting information for each job step to charge usage of the system, help plan new applications, and help supervise system operation more efficiently.

LSERV (label cylinder display): A program that formats a listing of the label cylinder located on SYSRES. LSERV can run in any partition and outputs the list on SYSLST, which may be assigned to disk, tape, or printer.

MCAR (machine check analysis and recording): A feature that records System/370 machine check interrupt error information on the system recorder file and then attempts to recover from the interrupt.

MCRR (machine check recording and recovery): The recording of pertinent data on the system recorder file after either a machine check interrupt or a channel inbound error has occurred on System/360 Model 30, Model 40, or Model 50.

OBR (Outboard Recorder): A feature that records pertinent data on the system recorder file when an unrecoverable I/O error occurs.

PCIL (private core image library): A file referenced in the same manner and for the same purposes as the system core image library, but distinct from the system core image library. PCIL increases available core image library space to enable compiling, link editing, and executing in the foreground partition, when a private core image library is assigned to that foreground partition.

PDAID (Problem Determination Aids): Programs that trace a specified event when it occurs during the operation of a program. The programs provided are F/L Trace, I/O Trace, GSVC Trace, QTAM Trace, and the transient dump.

private library: A core image, relocatable, or source statement library that is separate and distinct from the system library.

problem determination: A procedure or process (provided by IBM) that the user can follow after an error message to determine the cause of that error. (See PDAID)

QTAM trace: A program that records certain supervisor and I/O activities on tape or in main storage.

RMS (recovery management support): A feature for System/370 that consists of the MCAR (machine check analysis and recording)

and CCH (channel check handler) functions. RMS gathers information about System/370 hardware reliability and attempts certain error recovery operations. RMS is a part of the entire reliability, availability, and serviceability support for System/370.

SDR (statistical data recorder): A feature that records the cumulative error status of an I/O device on the system recorder file.

stand-alone dump: A program that displays the contents of main storage from a minimum of 8K bytes to a maximum of 16384K bytes. It helps to determine the cause of an error.

system recorder file: The file that is used to record hardware reliability data.

trace:

1. To record a series of events as they occur.
2. The record of a series of events.

Indexes to systems reference library manuals are consolidated in the publication DOS Master Index, GC24-5063. For additional information about any subject for the same subject in the Master Index.

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