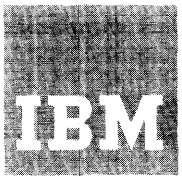
File Number S360-20
Form C24-5022-2

DOS



Systems Reference Library

IBM System/360 Disk Operating System Operating Guide

Program Numbers:

System Control and Basic IOCS	360N-CL-453
Supervisor (6K)	360N-SV-474
Supervisor (8K)	360N-SV-475
Consecutive Disk IOCS	360N-IO-455
Consecutive Tape IOCS	360N-IO-456
Direct Access Method (DAM) Macros	360N-IO-454
Indexed Sequential File Management System (ISFMS) Macros	360N-IO-457
Consecutive Paper Tape IOCS	360N-IO-458
Compiler I/O Modules	360N-UT-462
Group 1 Utilities (Disk and Unit Record)	360N-UT-461
Group 2 Utilities (Magnetic Tape)	360N-UT-462
Group 3 Utilities (Data Cell)	360N-UT-463
Multiprogramming Support Utility Macros	360N-UT-471
Vocabulary File Utility Program	360N-UT-472
Disk Sort/Merge	360N-SM-450
Tape Sort/Merge	360N-SM-400
Assembler	360N-AS-465
Report Program Generator	360N-RG-460
COBOL	360N-CB-452
COBOL DASD Macros	360N-CB-468
FORTRAN IV	360N-FO-451
Autotest	360N-PT-459
Basic Telecommunications Access Method	360N-CQ-469

This publication describes the operating procedures to be followed when executing jobs in a multiprogramming environment using the Disk Operating System. Topics discussed in this reference publication include: stacked-job processing capability, multiprogramming, basic telecommunications capability, and functions the operator must perform to initiate system operation and to communicate with the system. A quick reference listing of all system-to-operator messages is included.

For a description of the concepts of the Disk Operating System, see IBM System/360 Disk and Tape Operating Systems Concepts and Facilities, Form C24-5030. Information concerning the operation of the System/360 can be found in IBM System/360 Model 30 Operator's Guide, Form A24-3373, or a corresponding publication. For a list of other associated System/360 publications, see the IBM System/360 Bibliography, Form A22-6822.

PREFACE

This publication provides information necessary for executing all IBM-supplied programs in the IBM System/360 Disk Operating System. It should be used in conjunction with the appropriate publication describing the operation of the installation's System/360.

The most significant changes in this edition are the addition of multiprogramming and telecommunications capabilities. Other significant changes include the following.

- Simplified procedure for responding to I/O errors.
  An I/O error that requires operator intervention to ready a device no longer requires an explicit response on the IBM 1052 Printer-Keyboard. When the operator makes the device ready, the system automatically resumes processing.
- System inquiry capabilities.
  The operator can initiate an inquiry to a background program by pressing the interrupt key on the processor. The IBM 1052 Printer-Keyboard can be used to initiate an inquiry to a foreground program.
- Operator-controlled storage allocation.
  The operator can allocate storage between jobs or job steps. Under certain conditions, the operator can allocate storage dynamically while a program is running.
- Combined file input/output capability.
  The operator can assign SYSOUT (a combination of SYSLST and SYSPCH) to a tape unit, and SYSIN (a combination of SYSRDR and SYSIPT) to a card reader, tape unit, or disk. The user must supply his own program to print and punch a combined system output file. The MPS utility macros may be used for the purpose.

Third Edition, February 1967

This edition, C24-5022-2, is a major revision of, and obsoletes, C24-5022-1. It also obsoletes Technical Newsletters N24-5192 and N24-5097.

Changes are indicated by a vertical line to the left of the affected text and to the left of affected parts of figures. A dot (•) next to a figure title or page number indicates that the entire figure or page should be reviewed.

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

Requests for copies of IBM publications should be made to your IBM representative or to the IBM branch office serving your locality.

A form is provided at the back of this publication for readers' comments. If the form has been removed, comments may be addressed to IBM Corporation, Programming Publications, Endicott, New York 13760.

REFERENCE PUBLICATIONS

Programmer diagnostics and information about setting up jobs are contained in the specifications publication describing each of the DOS programs. A listing of these publications follows:

1. IBM System/360 Disk Operating System: System Control and System Service Programs, Form C24-5036;
2. IBM System/360 Disk and Tape Operating Systems: Assembler Specifications, Form C24-3414;
3. IBM System/360 Disk and Tape Operating Systems: COBOL Programmer's Guide, Form C24-5025;
4. IBM System/360 Disk and Tape Operating Systems: FORTRAN IV Programmer's Guide, Form C24-5038;
5. IBM System/360 Disk and Tape Operating Systems: Report Program Generator, Form C26-3570;
6. IBM System/360 Disk and Tape Operating Systems, Tape Sort/Merge Program Specifications, Form C24-3438;
7. IBM System/360 Disk and Tape Operating Systems: Utility Programs Specifications, Form C24-3465;
8. IBM System/360 Disk Operating System: Autotest Specifications, Form C24-5062;
9. IBM System/360 Disk Operating System: Vocabulary File Utility Program, Form C27-6924.

Machine publications providing information about the input/output devices on the system are as follows:

For card readers and card punches:

1. IBM 1442 N1 and N2 Card Read Punch, Form A21-9025;
2. IBM 2501 Card Reader, Models B1 and B2, Form A21-9026;
3. IBM 2520 Card Read Punch, Model B1 and Card Punch, Models B2 and B3, Form A21-9027;
4. IBM 2540 Component Description and Operating Procedures, Form A21-9033.

For printers:

1. IBM 1403 Printer, Form A24-3073.
2. IBM 1404 Printer, Form A24-1446.
3. IBM 1443 Printer, Models 1, 2, N1, and IBM 1445 Printer, Models 1, N1, Form A24-3120.

Also see IBM 2821 Control Unit, Form A24-3312.

For the printer-keyboard: IBM 1050 Operator's Guide, Form A24-3125.

For magnetic tape units: IBM 2400 Magnetic Tape Units and 2816 Switching Units--Principles of Operation, Form A22-6866.

For disk storage and data cell drives: IBM System/360 Component Description--2841 Storage ontrol Unit: 2302 Disk Storage, Models 3 and 4; 2311 Disk Storage Drive; 2321 Data Cell Drive, Model 1; 7320 Drum Storage, Form A26-5988.

For paper tape readers: IBM 2671 Paper Tape Reader, Form A24-3388.

BATCHED-JOB PROCESSING

The IBM System/360 Disk Operating System is designed to provide an orderly transition between programs executed in a stacked-job environment. In order that the time interval between the execution of jobs be kept to a minimum, a control program remains in main storage during the execution of all programs in the system. One of the main functions of the control program is to transfer control from one function to the next.

Because the control program resides on disk, it must be read into main storage by an IPL (Initial Program Loading) procedure before the first job can be processed. A job may consist of either the execution of a single program in the system or the execution of more than one program. Each execution is called a job step. Thus, a job consists of a series of one or more job steps.

In preparing to execute a job, the operator must be sure that:

1. Input for the control program is on the correct device. This can be a card reader, magnetic tape unit, or disk.
2. Input for the processing program is on the correct device. This can be a card reader, magnetic tape unit, or disk.
3. Any I/O devices referenced by the processing program have been readied.

After the operator has checked the preceding items, his primary function is to monitor messages that may appear on the 1052 printer-keyboard, and to service, as required, card readers and punches, printers, magnetic tapes, disk units, etc.

MULTIPROGRAMMING

For those systems with main storage equal to or greater than 32K, the Disk Operating System offers multiprogramming support. This support is referred to as Fixed Partitioned Multiprogramming, because programs are assigned to fixed locations when they are cataloged to the system. A program occupies a contiguous area of storage. The amount of main storage allocated to programs to be executed may be determined when the system is generated, or by the operator before the program is loaded into main storage for execution.

There are two types of problem programs in multiprogramming: background and foreground. Background programs are initiated by Job Control from the batched-job input stream. Foreground programs are initiated by the operator from the printer-keyboard. Foreground programs do not execute from a stack. When one is completed, the operator must explicitly initiate the next program.

Background and foreground programs initiate and terminate independently.

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 interruptions enabled. When an interruption occurs, the Supervisor gains control, processes the interruption, and gives control to the highest priority program that 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. For example, this condition would occur when a WRITE operation is issued to a tape unit. Control is taken away from a lower priority program when an event on which a higher priority program was waiting has been completed. In the previous example, control would return to the high priority program when the WRITE I/O operation has been executed. When all programs in the system are simultaneously waiting (i.e., no program can process), the system is placed in the wait state enabled for interruptions. Interruptions are received and processed by the Supervisor. When an interruption satisfies a program's wait condition, that program becomes active and competes with other programs for CPU processing time.

In addition to at least 32K positions of main storage, multiprogramming support requires the storage protection feature.

Note that programs produced by the FORTRAN and PL/I compilers may not be run as foreground programs, because the object programs produced by these compilers use system facilities available only to background programs. Also, source programs cannot be assembled or compiled in foreground program areas.

JOB CONTROL (BACKGROUND PROBLEM PROGRAM AREA ONLY)

The execution of all programs in the background area is under the supervision of a control program (Job Control).

The main function of the control program is to transfer control from one job step to the next. Job Control is called by:

1. The Initial Program Loader, to process the first job in the background area after an IPL procedure.
2. The Supervisor, at the normal or abnormal end-of-job for all programs run in the background area.

A job may consist of either the execution of a single program in the system or the execution of more than one program. Each execution is called a job step. Thus, a job consists of a series of one or more job steps.

CONTROL PROGRAM INPUT

The Job Control program requires certain input statements to exercise its control function. These statements, referred to as job-control statements, describe each job step that is to be executed in the program. The format of each of the job-control statements is shown in Appendix A.

Each job normally contains a JOB, one or more EXEC's, and a /& control statement. The other statements are optional, depending upon the job requirements. For example, if disk files are used, VOL, DLAB, and XTENT statements may also be required. The name of each statement and its function are as follows:

Statement	Function
// ASSGN	Used to assign symbolic names to physical input/output devices.
// DATE	Provides a date for the job being executed.
// DLAB	Provides DASD (direct access storage device) file label information.
// EXEC	Always the last statement read before a program is executed. It initiates the execution of a job step and can provide the name of the program to be executed.
// JOB	Always the first job statement. It provides the job name.
// LBLTYP	Defines the amount of storage to be reserved at linkage edit time for processing tape and nonsequential disk file labels.
// LISTIO	Prints I/O assignment listings.
// MTC	Initiates magnetic tape control operations.
// OPTION	Establishes program options.
// PAUSE	Causes the system to stop processing input until operator intervention.
// RESET	Resets I/O device assignments to the standard assignments as modified by the operator.
// RSTRT	Provides identification and location of checkpoint records for restarting a job, and starts the execution of the job.
// TPLAB	Provides magnetic tape file label information.
// UPSI	Sets user program switch indicators used by the individual program.
// VOL	Provides volume label information.
// XTENT	Indicates the limits of a file on a DASD unit.
/*	Indicates end-of-data file input for a job step.
/&	Always the last statement in every job. Indicates end-of-job.
*	Used for programmer-to-operator comments.

PROCESSING PROGRAM INPUT

A processing program can be a language translator (such as Assembler), a utility program, a sort program, or a user's compiled program that is to be executed by the system.

As with control program input, all input for a processing program is prepared by the programmer. For example, this input can be a set of source statements to be assembled or compiled, or a set of statements describing an input file for a utility program. Regardless of the content of the processing program input, the operator need be concerned only that the input is on the correct input device.

I/O DEVICE ASSIGNMENTS

Symbolic names are used to reference all input/output devices in the system. These names are divided into two classes: system logical units and programmer logical units. A listing of the logical units, their functions, and the actual devices to which they can be assigned is shown in Figure 1.

System logical units (SYSIPT, SYSLNK, SYSLOG, SYSLST, SYSPCH, SYSRES, and SYSRDR) are used by the control program and by various IBM-supplied processing programs. All of these units can also be used by user programs operating in the background problem-program area. With the exception of SYSLOG, foreground programs may not reference any system logical unit. Foreground programs may reference any programmer logical unit, SYS000-SYS244.

Programmer logical units are defined at system-generation time for each class of problem program (background, foreground-one, and foreground-two) to be run in the system. In a multiprogramming environment, the same SYSnnn can be defined for the background and both foreground areas. For example SYS000 can be assigned to separate physical devices in all three program areas. The combined number of programmer logical units for all program classes defined for the system may not exceed 244.

For the convenience of the user, two additional system logical unit names are defined for background programs. These names are used only in certain Job Control statements (e.g., CLOSE, ASSGN, VOL, and XTENT).

SYSIN--Name that can be used when SYSRDR and SYSIPT are assigned to the same card reader, magnetic tape unit, or disk.

SYSOUT--Name that must be used when SYSPCH and SYSLST are assigned to the same magnetic tape unit.

Some system logical units must be assigned to certain selected devices. For example, the system logical unit SYSLOG is usually assigned to a 1052 printer-keyboard. If a 1052 printer-keyboard is not available, SYSLOG must be assigned to a printer. SYSLOG can never be assigned to any other physical device.

When the system is generated, the symbolic names for the background problem-program area are assigned to certain standard physical devices. These assignments can be changed by the operator at any time the system will accept operator-to-system communications. Device assignments made by the operator can be either permanent or temporary, i.e., they remain the same from job-to-job or are reset to the standard assignment by the next /& or // JOB statement. The assignments that were made during system generation become effective after an IPL. The system logical unit SYSOUT must be a permanent assignment.

Symbolic Name	Function	May be Assigned To	Remarks
SYSRES	System residence unit	2311 Disk Storage Drive	Assignment is established by the system during an IPL and cannot be altered until another IPL occurs.
SYSRDR	Job Control Background program input device	Card Readers: 1442, 2501, 2520, or 2540 Magnetic Tape Units: 2400 Series Disk Storage Drive: 2311	1. Tape units may be either 7- or 9-track (dual density). If 7-track, the data conversion feature is required. 2. If the 1052 printer-keyboard is inoperable, SYSRDR must be assigned to a card reader.
SYSIPT	Processing program input device	Card Readers: 1442, 2501, 2520, or 2540 Magnetic Tape Units: 2400 Series Disk Storage Drive: 2311	1. Tape units may be either 7- or 9-track (dual density). If 7-track, the data conversion feature is required. 2. If the 1052 printer-keyboard is inoperable, SYSIPT must be assigned to a card reader. 3. SYSIPT and SYSRDR may be assigned to the same physical device. 4. Required for system generation and maintenance, and language translators.
SYSIN	Assign SYSIPT and SYSRDR to the same physical device	Same units as SYSIPT	1. Tape units may be either 7- or 9-track (dual density). If 7-track, the data conversion feature is required. 2. If the 1052 printer-keyboard is inoperable, SYSIN must be assigned to a card reader.
SYSPCH	Punched output	Card Punches: 1442, 2520, or 2540 Magnetic Tape Units: 2400 Series Disk Storage Drive: 2311	1. Tape units may be either 7- or 9-track (dual density). If 7-track, the data conversion feature is required. 2. If the 1052 printer-keyboard is inoperable, SYSPCH must be assigned to a card punch. 3. SYSLST and SYSPCH may be assigned to a single magnetic tape (see SYSOUT). 4. Required for system generation and maintenance, and for language translators.
SYSLST	System output unit	Printers: 1403, 1404, 1443, or 1445 Magnetic Tape Units: 2400 Series Disk Storage Drive: 2311	1. Tape units may be either 7- or 9-track (dual density). If 7-track, the data conversion feature is required. 2. 1404 used for continuous forms only. 3. If SYSPCH and SYSLST are assigned to a tape unit, they can be assigned to the same physical device (see SYSOUT). 4. If the 1052 printer-keyboard is inoperable, SYSLST must be assigned to a printer. 5. The 1445 printer must be used as a 1443 printer. 6. Required for system generation and maintenance, and for language functions.
SYSOUT	Assign SYSPCH and SYSLST to the same physical device	2400 Series Magnetic Tapes only	1. Tape units may be either 7- or 9-track (dual density). If 7-track, the data conversion feature is required. 2. If the 1052 printer-keyboard is inoperable, SYSOUT cannot be assigned.
SYSLNK	Compile/Link Edit and Execute system file	2311 Disk Storage Drive	1. Must be a single XTENT.
SYSLOG	Operator Messages	Printer-Keyboard: 1052 Printers: 1403, 1404, 1443, or 1445	1. Can be used by any program. 2. If the 1052 printer-keyboard is inoperable, SYSLOG must be assigned to a printer.
SYS000 to SYS244	I/O operations for processing programs	Card Readers: 1442, 2501, 2520, or 2540 Card Punches: 1442, 2520, or 2540 Printers: 1403, 1404, 1443, or 1445 Magnetic Tape Units: 2400 Series Disk Storage Drive: 2311 Data Cell Drive: 2321 Paper Tape Readers: 2671 Printer-Keyboard: 1052 Data Collection System: 1030 Data Communication System: 1050, or 1060 Selective Calling Stations: AT&T 83B3 Teletypewriter Terminal: AT&T Models 33 and 35 Western Union Plan: 115A Outstation	1. If a dump of a foreground program is desired, SYS000 must be assigned to a printer or magnetic tape unit. All storage dumps in the background area use SYSLST. 2. SYS000 through SYS009 are the minimum number of units defined in any system. 3. Tape units may be either 7- or 9-track (dual density). If 7-track, the data conversion feature is required. 4. The 1404 printer is used for continuous forms only.

Note: System logical units (e.g. SYSLST, SYSLNK) cannot be used during foreground initiation.

Figure 1. Symbolic Unit Names

MESSAGES FROM THE SYSTEM

The system communicates with the operator by issuing messages on SYSLOG, normally assigned to the IBM 1052 Printer-Keyboard. If no response or action is required, an I-indicator is included in the message and processing continues. If an operator action or reply is required, an action indicator A or D is included in the message. The program issuing the message usually waits until the operator keys in a response. An exception would be a message indicating intervention-required action for a specific device.

The system-to-operator messages have two basic forms. The first form (illustrated here) consists of a two-character program identifier (prefix), followed by a four-character message code, and comments. The comments can extend to more than one line but the program identifier and message code are not repeated on succeeding lines.

```
BG xxxxc [...Comments...]
         [...Comments...]
         [...Comments...]
```

The following program identifiers are used in multiprogramming.

Identifier	Program
BG	Background program
F1	Foreground-one program
F2	Foreground-two program
AR	Attention routine
SP	Supervisor

The second form of system-to-operator message consists of two lines. The first line contains the program identifier and is followed by any comments. The second line consists of the message code and message.

```
BG [...Comments...]
xxxxc [...Message...]
```

The message code is further divided as follows. The first character of the message code indicates the message origin, which can be one of the following.

0xxx Supervisor or IPL	7Dxx Disk Sort/Merge
1xxx Job Control	7Txx Tape sort/Merge
2xxx Linkage Editor	8xxx Utilities
3xxx Librarian	9xxx Autotest
4xxx Logical IOCS	Axxx Assembler
5xxx PL/I	Bxxx FORTRAN
6xxx RPG	Cxxx COBOL

The second, third, and fourth characters of the message code are the message number. The action indicator (c) following the message number specifies the type of operator action required.

The message itself contains all information pertaining to the operator's decision and/or action. Each operator message is listed under System-to-Operator Messages with a corresponding cause and action description.

A typical system-to-operator message in multiprogramming format is:

```
BG 1C10A PLEASE ASSIGN SYSRDR
```

The characters, BG, indicate that this message was issued for a background program. The character, 1, indicates that Job Control issued the message. The characters, C10, are the message number. The character, A, indicates that operator action is required. (For example, the operator would respond by typing the assignment for SYSRDR on the 1052.) PLEASE ASSIGN SYSRDR is the content of the message.

When the operator is to respond to a message (or a series of messages) and there is no program-identifier prefix on the 1052, the response made is for the last message printed.

When a Supervisor routine such as OPEN or device-error-recovery is operating on behalf of a program, any messages it issues will contain the identifier for that program.

The action indicators are as follows.

Action Indicator	Meaning
A-Action:	The operator must perform a specific manual action before continuing; for example, mounting a magnetic tape, or readying an I/O device.
D-Decision:	The operator must make a choice between alternate courses of action.
I-Information:	The message does not require immediate operator action. For example, this type of message can be

used to indicate the successful termination of a problem program.

W-Wait: Used when an error condition (such as an error on SYSRES) occurs that makes it impossible to continue processing. This indicator is not printed on the printer-keyboard. Instead, a two-digit message is placed in byte 0 of main storage. The indicator W is placed in byte 1 of main storage. (See low-core error messages under System-to-Operator Messages.) The Wait state is entered, and all interruptions are disabled. The only way that the system can be restarted is to perform an IPL procedure.

S-SEREP: Used when a machine condition occurs that makes it impossible to continue processing. This indicator is not printed on the printer-keyboard, but may be displayed on the console. A two-digit message is placed in byte 0 of main storage. The indicator S is stored in byte 1 of main storage. A special diagnostic storage-display program (SEREP) supplied to customer engineers should be used when an S-condition occurs (see Appendix H and low-core error messages under System-to-Operator Messages).

COMMUNICATION TO THE SYSTEM

There are two means of communicating with the system: job-control statements and operator commands (see Appendix B). Job-control statements are distinguished by the double slash (//), in columns 1 and 2. Operator commands do not have this characteristic. The following table shows the differences between these two forms of communication.

	Job-Control Statement	
//	Operation Code	Operand(s)
	Operator Command	
	Operation Code	Operand(s)

Operator commands apply to either background (where applicable) or foreground programs. They may be entered through either SYSRDR or SYSLOG. Job-control statements are issued for batched job processing of background programs only and are normally entered through SYSRDR. Because operator commands are acceptable at any time operator-to-system responses are enabled, it is preferable to use the command whenever possible. If an operator forms this habit, it is not necessary for him to remember when job-control statements are acceptable. Operator commands, if entered in accordance with their prescribed format, always produce the desired system action.

The operator communicates with the system by entering certain commands into the system. Commands are usually entered by using the 1052 printer-keyboard (SYSLOG). Communication is possible in any of the following instances.

- The operator has pressed the REQUEST key (see Using the Request Key).
- The programmer or operator has requested operator response by inserting a PAUSE statement in the input stream for a problem program running in the background area. (A PAUSE statement in the input job stream is not valid for foreground programs.)

Once a command has been processed, the printer-keyboard is unlocked to permit the operator to issue further messages. Operator-to-system Job Control commands are recognized on SYSRDR as well as on SYSLOG.

Each operator-to-system command consists of an operation code and one or more operands. The operation code describes the pending action and consists of from one to eight alphabetic characters. The operation code must be separated from the first operand by at least one blank. Operands are separated by commas.

There are four types of operator-to-system commands. A listing of all operator-to-system commands is shown in Appendix C. A description of all commands is contained in Operator Command Formats.

1. Job Control--issued between jobs or job

steps for batch processing in a multiprogramming environment.

2. Attention (ATTN)--issued at any time by pressing the request key on the 1052 printer-keyboard. Some of these commands can be issued only in a multiprogramming environment.

3. Foreground Program Initiation--may be issued only in a multiprogramming environment following the ATTN command: START [F1 or F2].

4. IPL--Initial Program Loading

By using the appropriate operator-to-system command, the operator can perform the following operations.

- Temporarily suspend processing. The PAUSE statement or command causes the system to pause between background jobs (or job steps). A programmer may use a // PAUSE statement to request operator action.

- End-of-block. The end-of-block character (B) signifies the end of each operator command entered through the 1052 printer-keyboard. It is entered by holding the alter code key down and typing a 5.

- Resume processing. The end-of-communications character (B) signifies the end of all operator commands and causes processing to continue. It is entered into the 1052 by holding the alter code key down and typing a 5.

- Cancel jobs. The CANCEL command, which can be issued at any time during the execution of a background, foreground-one, or foreground-two program, terminates the execution of that job after all outstanding interruptions have been handled.

- Change input/output device assignments. The ASSGN (ASSiGN) command assigns a symbolic name to a physical input/output device. The DVCDN (DeViCe DowN) command informs the system that a device is inoperative. The DVCUP (DeViCe UP) command informs the system that a formerly inoperative device is now operational. The RESET command resets temporary input/output assignments to the standard established at system generation time. Any temporary modifications made by the operator are also reset by this command.

- Perform magnetic tape operations. The MTC (Magnetic Tape Control) command performs magnetic tape operations such as rewinding tapes, rewinding and unloading tapes, etc.

- Closing files. The CLOSE command closes any magnetic tape unit assigned to SYSLST, SYSPCH, SYSOUT, SYSnnn, or to any disk file assigned to SYSRDR, SYSIPT, SYSIN, SYSPCH, or SYSLST, and allows a new device assignment to be made.

- Get information from the system. The LISTIO command prints a listing of input/output device assignments. The LOG command prints all job-control statements and/or foreground initiation commands as they occur on SYSLOG. (The NOLOG command suppresses the logging of most job-control statements or foreground initiation commands.)

- Set system values.
  During IPL:
  SET--Sets the value for date and time
  ADD--Adds device to PUB table
  DEL--Deletes device from PUB table
  Between job steps:
  SET--Sets the values for line count, UPSI bytes, time, date, record count for SYSLST=disk and SYSPCH=disk.
  The SET, ADD, and DEL commands are described in the section Starting The System (IPL Procedure).

Multiprogramming. The ALLOC, HOLD, MAP, RELSE, START, STOP, and UNA commands are valid only in a multiprogramming system.

ALLOC--Allows the operator to allocate main storage partitions to the desired sizes.
HOLD --Holds the current I/O assignments for the foreground area(s) until released by RELSE command.
MAP --Prints the current main storage partitions on SYSLOG.
RELSE--Sets the current I/O assignments for the specified foreground area(s) to unassigned at the completion of the active program for that area.
START--Causes either background job processing to continue or starts foreground program initiation.
STOP --Causes the background job processing to stop. Job Control does not issue a read command to SYSLOG.
UNA --Causes physical units currently assigned to a foreground area(s) under the HOLD command to be unassigned. The specified foreground area must be inactive.

These commands are described in greater detail in Operator Command Formats. Although the normal communication device is SYSLOG (1052 printer-keyboard), operator-to-system commands are also recognized on SYSRDR.

USING THE REQUEST KEY

While processing in either the background or foreground problem areas, the 1052 printer-keyboard is locked. If the operator presses the request key, message 1I60A READY FOR COMMUNICATIONS is printed. The keyboard is then unlocked and any valid ATTN command can be entered.

The attention request is ignored if:

1. The system is executing a condense function.
2. The system is executing a re-allocation function.

If the logical transient area in the Supervisor is active when the request is made, the request is held until the logical transient area is released by the problem program. There are some program failures that will never release the logical transient area. For example, the logical transient area will not be released if there is a loop in a user-label routine while opening a file. In such a case, the attention key may be pressed again. The following message will be issued:

1I40D EMERGENCY CANCEL

The operator may either ignore the message (respond (B)) or respond with the CANCEL operation command. If the message is ignored, the original request remains pending.

The valid operator-to-system commands are listed in Figure 2.

Some entries in the operand field of operator-to-system commands are represented in hexadecimal form. The hexadecimal form is signified by X'cuu'. The letters cuu represent the physical address of a device and can be the numeric characters 0-9 and the alphabetic characters A-F.

Each operator-to-system command is described in the following section. The conventions used to illustrate these commands are as follows:

1. Uppercase letters and punctuation marks (except as described in items 3 and 4 below) represent information that must be coded exactly as shown.

2. Lowercase letters and terms represent information that must be supplied by the operator.

3. Information contained within brackets [ ] represents an option than can be included or omitted depending on the requirements of the program.

4. Options contained within braces { } represent alternatives, one of which must be chosen.

5. Options that are underlined indicate the assumed value if no operand is provided.

ADD -- Add a Device to the PUB Table

ADD is an optional control command that is used to add a device (not assigned during system generation) to the PUB table. It is read from the operator communication device (either the 1052 or a card reader) and is acceptable only during the IPL procedure. The format of the ADD command is:

Operation	Operand
ADD	X'cuu'[(k)],devicetype[,X'ss']

X'cuu'= channel and unit numbers.

k= S, if the device can be switched (attached to two adjacent channels). The designated channel is the lower of the two channels.

k= 0-255 indicates the priority of a device that cannot be switched. The highest priority is 0. If k is not given, a priority of 255 is assumed. In a multiprogramming environment, all devices on a channel automatically have equal priority.

devicetype = (see following)
- 1050A for 1052 printer-keyboard
- 1403 for 1403 printer
- 1403U for 1403 printer with UCS feature
- 1404 for 1404 printer
- 1442N1 for 1442N1 card reader punch
- 1442N2 for 1442N2 card punch
- 1443 for 1443 printer
- 1445 for 1445 printer
- 2260 for 1. Local display Station
  2. 1053 attached to 2848
- 2311 for 2311 Disk Drive (DASD)
- 2321 for 2321 Data Cell Drive (DASD)
- 2400T7 for 7-track magnetic tapes
- 2400T9 for 9-track magnetic tapes
- 2501 for 2501 card reader
- 2520B1 for 2520B1 card reader punch
- 2520B2 for 2520B2 card punch
- 2520B3 for 2520B1 card punch
- 2540P for 2540 punch
- 2540R for 2540 card reader
- 2671 for 2671 paper tape reader
- 2701 for 2701 Line Adapter Unit. The code '2701' should be used only for lines with the following Adapters:
  IBM Terminal Adapters Types I, II, and III
  Telegraph Terminal Adapters Types I and II
- 2702 for 2702 Transmission Control Unit.
- 2703 for 2703 Transmission Control Unit
- 7770 for 7770 Transmission Control Unit
- 7772 for 7772 Transmission Control Unit
- UNSPB for unsupported device attached to Channel 0, which is either overrunnable or operates in burst mode.
- UNSP for unsupported device. If attached to Channel 0, it is not overrunnable and does not operate in burst mode.

X'ss' = Device specifications. If absent, the following values are assumed.

- X'C0' for 9-track tapes
- X'90' for 7-track tapes
- X'00' for non-tapes

COMMAND	MEANING	IPL	JC	AR	FI	WHEN ACCEPTED
ADD	Add a device to the PUB table.	X				During IPL SET date and clock only
DEL	Delete a device from the PUB table.	X				
SET	Set values in the communication area.	X	X			
CLOSE	Close magnetic tape output file or 2311.		X			Between Jobs and Job Steps
DVCDN	Device down (not available to system).		X			
DVCUP	Device up (now available to system).		X			
MTC	Magnetic tape control.		X			
RESET	Reset temporary I/O device assignments to system standard.		X			
STOP	Stop execution of background job.		X			
ALLOC	Allocate core storage.		X	X		Between Jobs and Job Steps and after pressing the request key on 1052.
MAP	List core storage allocations.		X	X		
PAUSE	Suppress processing (enter WAIT state).		X	X		
LOG	Log (print) job control statements.		X	X	X	Between Jobs and Job Steps, after pressing the request key on 1052, and as response to system message, and during foreground initiation
NOLOG	Suppress logging control statements.		X	X	X	
CANCEL	Cancel execution of current job.		X	X	X	
EOB (B)	End-of-block or communications.	X	X	X	X	During IPL between Jobs and Job Steps, after pressing the request key on 1052, and as response to system message, and during foreground initiation
CANCEL (C)	Cancel terminal response (1052).	X	X	X	X	
ASSGN	Assign logical name.		X		X	Between Jobs and Job Steps and during foreground initiation
HOLD	Hold current foreground assignments.		X		X	
LISTIO	List current I/O assignments.		X		X	
RELSE	Release current foreground assignments and unassign them at the end of any job initiated for that area.		X		X	
UCS	Load universal character set buffer.		X		X	
UNA	Set all assignments for foreground area to unassigned. The specified area must be inactive.		X		X	
MSG	Give control to a foreground communication routine.			X		After pressing the request key on the 1052
START	Initiates a foreground program or resumes batch processing.			X		
TIMER	Transfers timer support to indicated program.			X		
VOL	Disk volume information.				X	During foreground initiation
DLAB	Disk label information.				X	
EXEC	Initiate program execution.				X	
READ	Specifies a card reader from which further foreground initiation commands are read.				X	
TPLAB	File label information.				X	
XTENT	Disk extent information.				X	

1. Job Control (BG)
2. ATTN Routine (AR)
3. Foreground Initiation (F1, F2)

● Figure 2. Valid Operator Commands

There are two possible device specifications for 9-track tape units -- X'C0' and X'C8'. By definition, C0 is the normal reset mode for the device and specifies the maximum byte density for that device. For example, C0 for a 9-track single-density tape unit is 800 bpi (bytes per inch), whereas for a dual-density tape unit it is 1600 bpi. C8 is an alternate mode setting for 9-track dual-density tapes only. When the system is generated, it is possible to make an explicit selection of mode setting for each magnetic tape unit, or let the system take a standard action. If the latter action is chosen, the system will always assume C0 for the device. From the definition of C0 above, this will result in a mode setting of 800 bpi for 9-track single-density units and 1600 bpi for dual-density units.

X'00', X'01', X'02', and X'03' are invalid as X'ss' for magnetic tape. This parameter is used to specify SADxxx requirements for 2702 lines:

X'00' for SAD0
X'01' for SAD1
X'02' for SAD2
X'03' for SAD3

This information is not accepted on the ASSGN statement.

The tape specifications are:

Density (Bytes Per Inch)	Parity	Convert Feature	Translate	ss
200	odd	on	off	10
200	odd	off	off	30
200	odd	off	on	38
200	even	off	off	20
200	even	off	on	28
556	odd	on	off	50
556	odd	off	off	70
556	odd	off	on	78
556	even	off	off	60
556	even	off	on	68
800	odd	on	off	90
800	odd	off	off	B0
800	odd	off	on	B8
800	even	off	off	A0
800	even	off	on	A8
800	single-density 9-track tapes			C0
1600	dual-density 9-track tapes			
800	dual-density 9-track tapes			C8

The end-of-block character B (alter code 5) must be given after each ADD command if the communication device is a printer-keyboard.

ALLOC -- Allocate Main Storage Command

The ALLOC command permits the operator to allocate main storage among foreground programs (Figure 3). Any remaining storage is automatically assigned to the background area. The number of bytes to be allocated for one or both foreground areas is specified in 2K (2048 bytes) increments. If only one foreground area is referenced, it is assumed that the amount of storage allocated to the other remains unchanged. The background area can never be less than 10K. For COBOL and Assembler with tape or disk work file variants, the background area should never be less than 14K.

Operation	Operand
ALLOC	{F1=nK[,F2=nK] / F2=nK[,F1=nK]}

The value n must be an even integer.

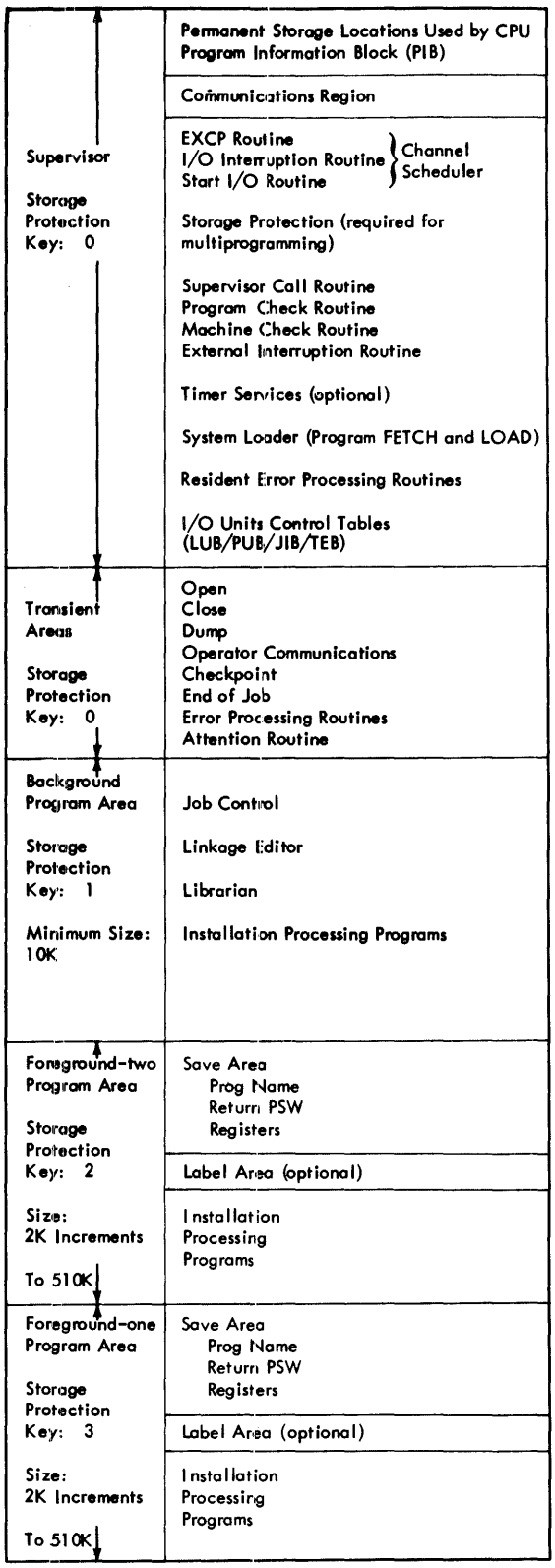
The following considerations apply to storage allocation among foreground and background programs.

1. The storage areas must always be contiguous.
2. The maximum size of a foreground area is 510K. This restriction does not apply to background programs.
3. To delete a foreground area from the system, an ALLOC command must be given specifying an area of 0K (zero K).
4. If storage allocation was specified when the system was generated, the IPL routine determines the size of main storage and allocates the specified foreground areas downward from high main storage.

Storage will not be allocated in the following instances.

Rule 1. The allocation would cause a decrease in the storage allocated to an active foreground or background program.

Rule 2. The allocation would result in the relocation of an active foreground program.



● Figure 3. Main Storage Organization

Rule 3A. A Job Control allocation would reduce the background area to less than 10K bytes.

Rule 3B. An ATTN allocation would reduce the background area, which is always considered active when allocating storage from the ATTN routine.

Figure 4 shows some examples of valid and invalid storage allocations that could be made by the operator. The operator can issue the MAP command to print on SYSLOG the areas of main storage allocated to programs operating in a multiprogramming environment.

The allocation command shifts the boundary allignment between partitions. For example, assume that the system has 64K with a 10K Supervisor. If the following allocation is made

```
ALLOC F1=16K,F2=16K
```

the boundary allignment will be:

AREA	No. K	UPPER LIMIT
SP	10K	10239
BG	22K	32767
F2	16K	49151
F1	16K	65535

If the MAP command is issued following the preceding allocation, a storage map similar to that printed here appears on SYSLOG.

All programs run in either foreground partition must be linkage edited for the starting boundary for the partition and cataloged into the core image library. In the preceding example, all programs initiated for F2 or F1 must be linkage edited for 32K and 48K, respectively.

NOTE: The operator should be aware that program phases previously cataloged into the core image library may not be executable if the boundary alignment is changed by the ALLOC command.

ASSGN -- Assign Logical Name Command

The ASSGN command is used to assign a logical I/O unit to a physical device. It can be used to change any device assignment that is previously specified. Its form is:

Present Program Allocation	Area	Area Status	New Allocation	Result	Reason
10K 4K	BG F1	Active	F1=2K	Invalid	Rule 1.
10K 2K 4K	BG F2 F1	Active Inactive	F1=6K F1=2K F1=2K F2=4K	Invalid Invalid Valid	Rule 2. Active program in F2 must be relocated to expand F1. Rule 2. Active program in F2 must be relocated to maintain contiguous storage between F1 and F2. Storage added to active program while maintaining contiguous areas.
10K 2K	BG F2	Active	F2=4K	Invalid	Rule 3a or 3b.

Figure 4. Storage Allocation Examples

Operation	Operand
ASSGN	SYSxxx,address [{,X'ss' / ,ALT}] [,TEMP]

The entries in the operand represent the following:

SYSxxx Symbolic unit name, which may be one of the following for the background area:

SYSRDR
SYSIPT
SYSIN
SYSPCH
SYSLST
SYSOUT
SYSLNK
SYSLOG
SYS000-SYS244

Note: Assignments for SYSOUT must be permanent; that is, not reset between jobs. If a system unit is assigned to a tape, the unit must be closed before it is free for another assignment.

SYSxxx can only be SYS000-SYS244 for either foreground area.

address can be expressed as X'cuu', UA, or IGN.

X'cuu' Indicates the channel and unit number (in hexadecimal).
c = 0 for multiplexor channel
c = 1-6 for selector channels 1-6
uu = 00-FE (unit number; 0-254 in hexadecimal)

UA Indicates the logical unit is to be unassigned. Any operation attempted on an unassigned device results in job cancellation.

IGN Indicates that the logical unit is to be unassigned and that all program references to the unit are to be ignored. This operand is not valid for SYSRDR, SYSIPT or SYSIN.

TEMP Specifies a temporary assignment for background programs only.

X'ss' Device specifications (used to specify mode settings for 7-track and 9-track tapes). If X'ss' is not specified, the mode settings remain unchanged. The LISTIO command may be used to determine the current mode settings for all magnetic tape units. The specifications are as shown here.

ALT Indicates an alternate magnetic tape unit that is used when the capacity of the original assignment is reached. The characteristics of the alternate unit must be the same as those of the original unit. Multiple aternates may be assigned to a symbolic unit.

Device Specifications:

ss	Bytes per Inch	Parity	Translate Feature	Convert Feature	
10	200	odd	off	on	Valid
20	200	even	off	off	
28	200	even	on	off	
30	200	odd	off	off	for
38	200	odd	on	off	
50	556	odd	off	on	
60	556	even	off	off	7-track
68	556	even	on	off	
70	556	odd	off	off	
78	556	odd	on	off	tape
90	800	odd	off	on	
A0	800	even	off	off	
A8	800	even	on	off	only
B0	800	odd	off	off	
B8	800	odd	on	off	
C0	800	single-density 9-track tapes			
	1600	dual-density 9-track tapes			
C8	800	dual-density 9-track tapes			

NOTE
The ALT operand is not valid for any system input file (e.g., SYSRDR, SYSIPT, SYSIN). It is also invalid for SYSLNK and SYSLOG.

CANCEL -- Cancel Command

The CANCEL command with a blank operand can be used to:

- Cancel foreground initiation. When this command is issued, all previous foreground initiation commands are ignored and control is returned to the Supervisor.
- Cancel a job operating in a multiprogramming environment. The job is canceled after all outstanding interruptions are handled. When this command is issued for the background only, SYSRDR (and SYSIPT if assigned to a device other than SYSRDR) is read up to the first statement following the /& control statement (if the job begins with a // JOB statement). If a job does not begin with a // JOB statement and it is canceled before detecting a /& statement, the remaining job-control statements will not be automatically bypassed. To bypass these statements, the operator should type on the 1052 printer-keyboard the following commands:

```
// JOB xxxxxxxx
CANCEL (B) (B)
```

The remaining job-control statements will then be bypassed up to the statement immediately following the next /&.

The CANCEL command with an operand is used while in the ATTN routine to cancel either the background job or either foreground job. The form of the CANCEL command is:

Operation	Operand
CANCEL	{ blank / BG / F1 / F2 }

The operands BG, F1, and F2 must be used in the ATTN routine only (message prefix AR).

BG Indicates the background job is to be canceled.
F1 Indicates the foreground-one program is to be canceled.
F2 Indicates the foreground-two program is to be canceled.

If operand is blank, BG is assumed.

(C) -- Cancel 1052 Response Command

The (C) (Alter Code 0) command cancels the 1052 response and allows the operator to enter a new response. This command is useful if the operator has detected an error and wishes to correct it. The form of the command is:

Operation	Operand
(C)	blank

(C) is alter code 0.

CLOSE -- Close Unit Command

The CLOSE command is used to close either a system or programmer output logical unit assigned to a magnetic tape, or a system

logical unit assigned to a 2311 disk. The logical unit may optionally be reassigned to another device, unassigned, or, in the case of a magnetic tape file, switched to an alternate unit. Note that when SYSxxx is a system logical unit (SYSLST, SYSPCH, etc.), one of the optional parameters must be specified. When closing a programmer logical unit (SYS000-SYS244), no optional parameter need be specified. When none is specified, the programmer logical unit is closed and the assignment remains unchanged. Closing a magnetic tape unit consists of writing a file mark, an EOV trailer record, two file marks, and rewinding and unloading the tape.

Operation	Operand
CLOSE	SYSxxx [{ ,X'cuu'[,X'ss'] / ,UA / ,IGN / ,ALT }]

SYSxxx For 2311: SYSIN, SYSRDR, SYSIPT, SYSPCH, or SYSLST.
For magnetic tape: SYSPCH, SYSLST, SYSOUT, or SYS000-SYS244.

X'cuu' Specifies that after the logical unit is closed, it will be assigned to the channel and unit specified. c is the channel number (0-6) and uu is the unit number 00-FE (0-254) in hexadecimal. In the case of a system logical unit, the new unit will be opened if it is either a disk, or a magnetic tape positioned at load point.

X'ss' Device specifications (used to specify mode settings for 7-track and 9-track tapes). If X'ss' is not specified, the mode settings remain unchanged. The LISTIO command may be used to determine the current mode settings for all magnetic tape units.

UA Specifies that the logical unit is to be closed and unassigned.

IGN Specifies that the logical unit is to be closed and unassigned with the ignore option. This operand is invalid for SYSRDR, SYSIPT, or SYSIN.

ALT Specifies that the logical unit is to be closed and an alternate unit is to be opened and used. This operand is valid only for system output logical units (SYSPCH, SYSLST, or SYSOUT).

DEL -- Delete A Device From the PUB Table

DEL is an optional control statement that is used to delete a device from the PUB table. It is read from the operator communication device (either the 1052 or a card reader) and is acceptable only during the IPL procedure. Its form is:

Operation	Operand
DEL	X'cuu'

where cuu is the channel and unit numbers of the device to be deleted.

The end-of-block (B) (alter code 5) must be given after each DEL statement if the communication device is a printer-keyboard.

DLAB -- DASD Label Information Command

The DASD label command (completed on a continuation line) contains file label information for DASD label checking and creation. This statement must immediately follow the volume (VOL) command. The DLAB command and its continuation line have the following format.

Op	Operand
DLAB	'label fields 1-3', C
	xxxx,yyddd,yyddd,'systemcode'[,type]

'label fields 1-3'
The first three fields of the Format-1 DASD file label are contained just as they appear in the label. This is a 51-byte character string, contained within apostrophes and followed by a comma. The entire 51-byte field must be contained in the first of the two statements. Column 72 must contain a continuation character. The Format-1 label is shown in Appendix D. Fields 1-3 are:

File Name. 44-byte alphameric including file ID and, if used, generation number and version number of generation.

Format Identifier. 1-byte, EBCDIC 1.

File Serial Number. 6-byte alphameric, must be the same as the volume serial number in the volume label of the first or only pack of the file.

C Continuation character in column 72.

xxxx Volume Sequence Number. This 4-digit EBCDIC number is the equivalent of the 2-byte binary volume sequence number in field 4 of the Format 1 label. This number must begin in column 16 of the continuation statement. Columns 1-15 are blank.

yyddd,yyddd
The File Creation Date, followed by the File Expiration Date. These two 5-digit numbers are the EBCDIC equivalent of the 3-byte discontinuous binary dates in fields 5 and 6 of the Format 1 label. yy is the year (00-99), and ddd is the day of the year (001-366).

'systemcode'
This field is never used by the Disk Operating System.

type Indicates the type of file label (SD, DA, ISC, or ISE). SD is assumed if this entry is omitted.

DTFSD or DTFPH with Mounted = single: type = SD or blank

DTFDA or DTFPH with Mounted = ALL: type = DA

DTFIS using Load Create: type = ISC

DTFIS using other than Load Create: type = ISE.

DVCDN -- Device Down Command

The DVCDN (DeViCe DowN) command is used to inform the system that a device is no longer physically available for system operation. It also resets the specified device to an unassigned status. A DVCUP command must be issued before any subsequent references to this device. This command is used when a device is being serviced or when a device is inoperative.

The DVCDN command uses the logical transient area, and will prevent operator communication until this area is free.

Operation	Operand
DVCDN	X'cuu'

The operand entry X'cuu' is expressed in hexadecimal form, where c is the channel number (0-6) and uu is the unit number, 00-FE (0-254 in hexadecimal).

DVCUP -- Device Up Command

The DVCUP (DeViCe UP) command is used to inform the system that a device, which was inoperative, is now available for system operations. An ASSGN operator command (or job-control statement) must be used to reassign this device.

The DVCUP command uses the logical transient area, and will prevent operator communication until this area is free.

Operation	Operand
DVCUP	X'cuu'

The operand entry X'cuu' is expressed in hexadecimal form, where c is the channel number (0-6) and uu is the unit number, 00-FE (0-254 in hexadecimal).

(B) -- End-of-Block Command

The end-of-block command, (B), must be issued after each operator command. Whenever the operator has finished communicating with the system, an additional (B) must be issued, which causes the communication routine to return control to the mainline job. When foreground initiation commands are entered through a card reader (as a result of a READ command), and an invalid command is encountered, an error message is printed on the printer-keyboard. It is now possible for the operator to enter valid commands through the 1052 printer-keyboard. The end-of-communications command, (B), causes input reading to be switched back to the device specified in the READ command.

Operation	Operand
(B)	blank

(B) is alter code 5.

1. End-of-block -- issued after each command
2. End-of-communication -- issued after final end-of-block to resume

processing, or as the first character of an operator response to a message.

EXEC -- Execute Program Command

The EXEC command is used to specify the foreground program to be executed. The program must have been cataloged into the core image library of the system. This command terminates the foreground initiation routines and causes the named foreground program to be loaded into main storage.

Operation	Operand
EXEC	progname

progname Represents the name of the program in the core image library to be executed. The program name can be one to eight alphameric characters.

When control is given to the foreground program, register 2 contains the address of the uppermost byte of storage available to the program.

HOLD -- Hold Assignments Command

This command causes all I/O assignments for the foreground area(s) specified to stay in effect until released by RELSE command. If the assignments in a foreground area are held, they will be overridden by any new assignments made during subsequent foreground initiation for that same area. The format of the HOLD command is:

Operation	Operand
HOLD	F1[,F2] F2[,F1]

LISTIO -- List I/O Assignment Command

The LISTIO command is used to cause the system to print a listing of I/O assignments on the printer-keyboard (SYSLOG). Some of the operands in the following list can be issued only between job steps. Others can be issued only during foreground initiation. A third group can be issued either between job steps or during foreground initiation. The form of the list I/O command is:

Operation	Operand
LISTIO	BG DOWN PROG SYS SYSxxx UNITS X'cuu' ALL F1 F2 UA

Physical units are listed with current device specification for magnetic tape units. Logical units are listed with ownership (background, foreground-one, or foreground-two), where applicable. List I/O uses the logical transient area, and will prevent operator communication until this area is free.

The following operands are valid between job steps and during foreground initiation.

ALL Lists the physical units assigned to all logical units.

F1 Lists the physical units assigned to all foreground-one logical units.

F2 Lists the physical units assigned to all foreground-two logical units.

UA Lists all physical units not currently assigned to a logical unit.

The following operand is valid only during foreground initiation.

BG Lists the physical units assigned to all background system and programmer logical units.

The following operands are valid only between job steps.

DOWN Lists all physical units specified as inoperative.

PROG Lists the physical units assigned to all background programmer logical units.

SYS Lists the physical units assigned to all background system logical units.

SYSxxx Lists the physical units assigned to the specified logical unit. SYSOUT and SYSIN are not valid in this command.

UNITS Lists the logical units assigned to all physical units.

X'cuu' Lists the logical units assigned to the specified physical unit.

LOG -- Log Command

The LOG command is used to cause the system to log columns 1-72 of all Job Control statements and/or foreground initiation commands on SYSLOG until a NOLOG command is sensed.

Operation	Operand
LOG	blank

The operand field is ignored by the system.

MAP -- Map Main Storage Command

The MAP command is used to cause the system to print on SYSLOG the areas of main storage allocated to programs in a multiprogramming environment. It indicates what programs are being executed, and which has access to the interval timer. The form of the MAP command is:

Operation	Operand
MAP	blank

The map of main storage produced is in the following format.

Field 1	Field 2	Field 3	Field 4
SP		upper limit	
BG	size	upper limit	name
F2	size	upper limit	name
F1 T	size	upper limit	name

The fields indicate the following:

Field 1 (area identification)
- SP - Supervisor
- BG - Background area
- F2 - Foreground-two area
- F1 - Foreground-one area
- T - Indicates which program has interval timer support

Field 2 (size of area allocated)
The number of bytes allocated to the area in main storage. The size is printed in even multiples of 2K, where 2K is equal to 2048 bytes. For the background area, this represents the number of full 2K blocks. For example, if the area were actually 11.2K, the map would indicate 10K.

Field 3 (area upper limit of main storage)
The highest storage address allocated to the corresponding area is printed in decimal.

Field 4 (user name)
- BG - Background job name
- F2 - Foreground-two program name
- F1 - Foreground-one program name

When the name field is blank for F2 or F1, no active program is being executed in the area. When there is no active program in BG, 'NO NAME' will appear in this field.

MSG -- Transfer Control Command

The MSG command can be used to give control to a foreground program operator communications routine previously activated by a STXIT macro instruction. The form of the MSG command is:

Operation	Operand
MSG	{F1 / F2}

F1 Used to request a foreground-one program STXIT routine.

F2 Used to request a foreground-two program STXIT routine.

If the specified program has established no operator communication linkage, a message is printed on the printer-keyboard informing the operator of this condition.

MTC -- Magnetic Tape Command

The MTC command is used to initiate magnetic tape control operations. The first entry in the operand specifies the operation to be performed. The form of the MTC command is:

Operation	Operand
MTC	opcode, {SYSxxx[,nn] / X'cuu'}

The entry in the operand can be:

Op code	Meaning	Possible Use
BSF	BackSpace File	Backspace one file so tape is positioned for reading the tapemark preceding the file backspaced.
BSR	BackSpace Record	Backspace record.
ERG	ERase Gap	Erase gap
FSF	Forward Space File	Used when restarting a program. The tape is positioned beyond the tapemark following the file spaced over.
FSR	Forward Space Record	Locate a specific record within a file.
RUN	Rewind and UNload	Rewind and unload (from the console) a tape on a specific unit.
REW	REWind	Rewind (from the console) a tape on a specific unit.
WTM	Write Tape Mark	Write a tapemark on an output file.

The second entry, X'cuu', is expressed in hexadecimal form, where c is the channel number (0-6) and uu is the unit number, 00-FE (0-254 in hexadecimal). The alternate second entry, SYSxxx, represents any logical unit assigned to this device.

The optional third entry, nn, is a decimal number (01-99) that represents the number of times the specified operation is to be performed.

Although the IBM-supplied programs do not require the operator to perform magnetic tape operations, the MTC command may be very helpful to the user in performing magnetic tape operations from the 1052 printer-keyboard.

NOLOG -- Suppress Logging Command

The NOLOG command is used to cause the system to suppress the logging of all Job Control statements and/or foreground initiation commands on the 1052 printer-keyboard until a LOG command is sensed. For the background area, JOB, PAUSE, *, and /& will always be logged. Any control statement in error will also be logged. The form of the NOLOG command is:

Operation	Operand
NOLOG	blank

The operand field is ignored by the system.

PAUSE -- Pause Command

The PAUSE command is used to cause Job Control processing to pause at the end of the current background program job step, or at the end of the current background program job. At that time, the printer-keyboard is unlocked for message input. The end-of-communications command (B) causes processing to continue. The form of the PAUSE command is:

Operation	Operand
PAUSE	[any user comment]

The operand of the PAUSE command is not processed by the system. It is used only for operator documentation.

READ -- Specify Reader Command

The READ command is used to specify a card reader from which further foreground initiation commands are read. The device specified must not be assigned to any other program. The form of the READ command is:

Operation	Operand
READ	X'cuu'

The entry X'cuu' is expressed in hexadecimal form, where c is the channel number (0-6) and uu is the unit number, 00-FE (0-254) in hexadecimal.

RELSE -- Release Assignments Command

This command causes all I/O assignments for the foreground area(s) specified to be unassigned at the end of the current job active for that area. The form of the command is:

Operation	Operand
RELSE	{F1[,F2] / F2[,F1]}

RESET -- Reset I/O Assignments Command

The RESET command is used to reset designated background I/O assignments to the system standard. The standard assignments are those specified when the system was generated and those modifications made by the operator using the ASSGN command (without the TEMP option). The form of the RESET command is:

Operation	Operand
RESET	{SYS / PROG / ALL / SYSxxx}

SYS Resets all system logical units to their standard assignments.

PROG Resets all programmer logical units to their standard assignments.

ALL Resets all logical units to their standard assignments.

SYSxxx Resets the logical unit specified to its standard assignment.

SET -- Set Value Command

The SET command is used to initialize the date, clock, and UPSI configuration. It is also used to specify the number of lines to be printed on SYSLST and the remaining disk capacity when either SYSLST or SYSPCH is assigned to a disk. The form of the SET command is:

Operation	Operand
SET	[DATE=n1][,CLOCK=n2] [,UPSI=n3][,LINECT=n4] [,RCLST=n5][,RCPCH=n6]

The entries in the operand field represent the following.

DATE=n1 Must be specified at IPL time. (This operand is valid also during Job Control.) Sets the system date permanently to the specified value. n1 has one of the following formats.

mm/dd/yy
dd/mm/yy

mm specifies the month; dd specifies the day; yy specifies the year. The format used is selected when the system is generated.

CLOCK=n2 Must be specified at IPL time if the timer feature is present. (This operand is valid also during Job Control.) Sets the system clock to the specified value. n2 has the following format:

hh/mm/ss

hh specifies hours (00-23); mm specifies minutes (00-59); ss specifies seconds (00-59).

UPSI=n3 Never given at IPL time, but can be used at other times. Sets the bit configuration of the UPSI byte in the communication region. n3 consists of one to eight digits, either 0, 1, or X. Positions containing 0 are set to 0; positions containing 1 are set to 1; positions containing X are unchanged. Unspecified rightmost positions are assumed to be X.

LINECT=n4 Never given at IPL time, but can be used at other times. Sets the standard number of lines to be printed on each page of SYSLST. n4 is an integer between 30 and 99.

RCLST=n5 Never given at IPL time, but can be used at other times. n5 is a decimal number indicating the minimum number of records remaining to be written on SYSLST when assigned to disk before a warning is issued to the operator that the capacity of the extent is

near. If no value is given, the system sets RCLST equal to the value specified when the system was generated. If no value was specified, the system sets RCLST equal to 1000.

RCPCH=n6 Never given at IPL time, but can be used at other times. n6 is a decimal number indicating the minimum number of records remaining to be written on SYSPCH when assigned to disk before a warning is issued to the operator that the capacity of the extent is near. If no value is given, the system sets RCPCH equal to the value specified when the system was generated. If no value was specified, the system sets RCPCH equal to 1000.

The SET command is also discussed in the section Starting the System (IPL Procedure).

START -- Start Background or Foreground Processing Command

The START command can be used to initiate a foreground program or to resume batch job processing. The form of the START command is:

Operation	Operand
START	{BG / F1 / F2}

BG Causes Job Control to read the next control statement in the background program job stream. The START BG command is effective only if a STOP command was issued previously.

F1 or F2 Specifies a foreground program is to be initiated and indicates the area to be used. The foreground initiation routines are given control. Commands that may be issued following the START command are shown in Figure 2 and Appendix C. If the specified foreground area is either being used by a program or has no area allocated to it, a message is printed on the printer-keyboard informing the operator of this condition.

STOP -- Stop Background Processing Command

The STOP command can be used in a multiprogramming environment to suspend background processing, or to indicate that there are no more background jobs to be executed. The form of the STOP command is:

Operation	Operand
STOP	blank

This command removes the background job from the system's task selection mechanism. The background area remains at least 10K bytes in size. If no foreground program is being executed, the system is placed in the wait state. Processing of background programs can be initiated by the START command.

Note that in a multiprogramming environment, it may be advisable to use a STOP command instead of a PAUSE command. The PAUSE command causes a read to be issued to SYSLOG, tying up the 1052 until the operator responds.

TIMER -- Interval Timer Command

The TIMER command causes interval timer support to be given to the program specified. The form of the TIMER command is:

Operation	Operand
TIMER	{BG / F1 / F2}

If interval timer support is already allocated to the program specified, the command is ignored. (This may result from a previously specified timer option specified when the system was generated, or a previous TIMER command.) If the interval timer was allocated to a different program and that program has an existing STXIT or SETIME linkage established, a message is printed on the printer-keyboard. If the command is accepted, the timer is set to the maximum interval. A subsequent STXIT or SETIME instruction issued by the program previously having access to the timer causes the cancellation of that program. Once established, timer support remains with an area from program-to-program until changed by a TIMER command, or a new IPL procedure is performed.

TPLAB -- Tape Label Information Command

The tape-label information command contains file label information for tape label checking and writing. This command must immediately follow the volume (VOL) command. The TPLAB command contains an image of a portion of the standard tape file label. The format and content of this label are presented in Appendix E. Label fields 3-10 are always included just as they appear in the label. These are the only fields used for label checking. The form of the TPLAB command is:

Operation	Operand
TPLAB	{'label fields 3-10' / 'label fields 3-13'}

'label fields 3-10'
This is a 49-byte character string, included within apostrophes (8-5 punch), identical to positions 5-53 of the tape file label. These fields can be included in one line.

'label fields 3-13'
This is a 69-byte character string, included within apostrophes (8-5 punch), identical to positions 5-73 of the tape file label. These fields are too long to be included on a single line. The character string must extend into column 71, a continuation character (any character) is present in column 72, and the character string is completed on the next line. The continuation line starts in column 16.

UCS -- Load Universal Character Set Buffer Command

The UCS command causes the 240-character Universal Character Set contained in the core image library phase specified by "phasename" to be loaded as buffer storage in the IBM 2821 Control Unit. The 240 EBCDIC characters correspond to the 240 print positions on 1403 chains and trains. A character sent to the printer for printing is matched against the characters in the UCS buffer, and when a match occurs, the corresponding chain/train character is printed in the print line position that the output character occupied.

The logical unit must be assigned to a 1403 printer with the UCS feature. It is the user's responsibility to assemble, linkage-edit, and catalog his UCS buffer phases into the core image library, and to mount the new chain or train before the UCS command is executed. The format of the UCS command is:

Operation	Operand
UCS	SYSxxx,phasename[,FOLD] [,BLOCK][,NULMSG]

SYSxxx The name of the logical unit assigned to a 1403 UCS printer to be loaded.

phasename
The symbolic name of the core image library phase containing the 240 EBCDIC characters to be loaded followed by an 80-character verification message. Each phase may have any valid phasename.

FOLD Signifies that the buffer is to be loaded with the folding operation code in the CCW.

BLOCK Signifies that the 2821 latch is to be set to inhibit data checks generated by the 1403 UCS printer due to print line-character mismatches with the UCS buffer.

NULMSG Signifies that the 80-character verification message is not to be printed on the 1403 after the buffer is loaded. If this parameter is not specified, after the UCS buffer has been loaded, the program will skip to channel one, issue a print of the last 80 characters in the phase specified by the first parameter, and again skip to channel 1. This identifies the phase, if the phase name is incorporated in the verification message. If the user's chain/train is identified by a unique character, this message may also be used to verify that the mounted chain or train is compatible with the contents of the UCS buffer. This can be done by including the unique character in the verification message.

The UCS phase format consists of a 240-character UCS buffer load and an 80-character verification message.

UNA -- Unassign Command

This command causes all I/O assignments for the specified foreground area(s) to be unassigned. A previous hold for the area remains in effect; i.e., any future assignments initiated in that area will be held. Both UNA and RELSE commands must be used to immediately unassign an area and

prevent an assignment from being held. The foreground area must be inactive. This command is intended to be used to free physical units currently assigned to a foreground area under the HOLD command. The format of the UNA command is:

Operation	Operand
UNA	{ F1[,F2] } { F2[,F1] }

VOL -- Volume Information Command

The VOL (volume) command is used when specifying a set of label information for a magnetic tape file or a DASD file. A VOL command must be used for each file on a multifile volume. The form of the VOL command is:

Operation	Operand
VOL	SYSnnn,filename

SYSnnn Symbolic unit name.

filename File name. This can be one to seven characters and is identical to the symbolic address of the program DTF that identifies the file.

XTENT -- DASD Extent Information Command

The extent command defines each area, or extent, for a DASD file. One or more XTENT statements must follow each DLAB statement. The form of the XTENT command is:

Operation	Operand
XTENT	type,sequence,lower,upper, 'serial no.',SYSxxx[,B_2]

type Extent Type. 1 or 3 columns, containing:

1 = data area (no split cylinder)
2 = overflow area (for indexed sequential file)
4 = index area (for indexed sequential file)
128 = data area (split cylinder). If type 128 is specified, the lower head is assumed to be $H_1H_2H_2$ part of the operand lower, and the upper head is assumed to be $H_1H_2H_2$ part of the operand upper.

sequence Extent Sequence Number. 1-3 columns, containing a decimal number from 0 to 255, indicating the sequence number of this extent within a multi-extent file. Extent sequence 0 is used for the master index of an indexed sequential file. If the master index is not used, the first extent of an indexed sequential file has sequence number 1. The extent sequence for all other types of files begins with 0.

lower Lower Limit of Extent. Nine columns, containing the lowest address of the extent in the form $B_1C_1C_1C_2C_2C_2H_1H_2H_2$, where:

B_1 = initially assigned cell number.

0 for 2311
0 to 9 for 2321

C_1C_1 = Subcell number.

00 for 2311
00 to 19 for 2321

$C_2C_2C_2$ = cylinder number.

000 to 199 for 2311
or
strip number:

000 to 009 for 2321

H_1 = head block position.

0 for 2311
0 to 4 for 2321

H_2H_2 = head number.

00 to 09 for 2311
00 to 19 for 2321

Although a part of the address (such as B_1 or $C_2C_2C_2$) can be zero, a lower extent of all zeros is invalid.

upper Upper Limit of Extent. Nine columns containing the highest address of the extent, in the same form as the lower limit.

Note: The last four strips of subcell 19 are reserved for alternate tracks on the 2321 data cell.

'serial no.'
Volume Serial Number. This is a 6-byte alphameric character string, contained within apostrophes. The number is the same as in the volume label (volume serial number) and the Format 1 label (file serial number).

SYSxxx This is the symbolic address of the DASD drive.

B_2 Currently assigned cell number.

0 for 2311
0-9 for 2321

This field is optional. If missing, $B_2=B_1$ is assumed.

STARTING THE SYSTEM (IPL PROCEDURE)

This section describes the IPL procedure that is used to start the system. Figures 5 and 6 provide a summary of this discussion.

The system pack must first be placed on a disk unit. The address of that disk unit must be selected from the load-unit switches on the console, and the load key must be pressed. This causes IPL and the supervisor portion of the control program to be read into low main storage. If a read error is sensed, the wait state is entered and an error code is stored in bytes 0-3 of main storage. Refer to messages 0I00, 0I01, and the low-core error messages under System-to-Operator Messages. When IPL and the supervisor portion of the control program have been read successfully, the wait state is entered (with all interruptions enabled). This part of the IPL procedure is the same whether a printer-keyboard or a card reader is used for operator communication.

When the wait state is entered, the operator communication device for IPL must be given to the system. If it is to be a 1052, the request key on the printer-keyboard is pressed. The message:

0I10A GIVE IPL CONTROL STATEMENTS

is printed on the printer-keyboard.

STEP	PROCEDURE	COMMENTS
1	Mount the system pack on a 2311 disk drive. Ready this device.	
2	Place job control statements in SYSRDR. Ready this device.	
3	Dial the load-unit switches on the system control panel to the address (channel and unit) of the 2311.	
4	Press LOAD.	IPL and the Supervisor are loaded into main storage. The system enters the wait state.
5	Press REQUEST.	This message prints: 0I10A GIVE IPL CONTROL STATEMENTS
6	If desired, enter ADD and DEL commands. Otherwise, omit this step.	Devices can be added to, or deleted from the PUB table.
7	Enter SET command.	The date is required. The time of day is required if the interval timer is present. No other SET command operands are acceptable. This message prints: 0I20I IPL COMPLETE Control is given to the control program.

● Figure 5. IPL Procedure Using 1052 Printer-Keyboard

STEP	PROCEDURE	COMMENTS
1	Mount the system pack on a 2311 disk drive. Ready this device.	
2	Place control statements in a card reader. Do not ready this device if it is to be assigned during this IPL.	These statements are: ADD } (optional, but if used, DEL } must be ahead of SET) SET (required) job control statements
3	Dial the load-unit switches on the system control panel to the address (channel and unit) of the 2311.	
4	Press LOAD	IPL and the Supervisor are loaded into main storage. The system enters the wait state.
5	Press INTERRUPT, if the card reader is assigned to SYSRDR, or Press START on card reader if it is not yet assigned to SYSRDR.	Control statements are read. Control is then given to the control program When the reader becomes ready, it is automatically assigned to SYSRDR. Control statements are read and control is then given to the control program.

● Figure 6. IPL Procedure Using a Card Reader for Control Statements

If a card reader is to be the operator communication device, there are two alternatives. If the card reader is not yet assigned to SYSRDR, the start key on the reader is pressed. (Feeding the first card causes the card reader to be automatically assigned to SYSRDR.) If the wrong device is readied, a low-core wait-state message will be given. No printed messages occur after the system enters the wait state. Instead, the first four characters of any message (0I10-0I21) are placed in bytes 0-3. For example, message 07Wcuu is given if the device rejected the command. If the device accepts the command, message 0I11A is given. If the card reader is already assigned to SYSRDR, the interrupt key on the console is pressed.

Control statements can now be read from the communication device.

The operator has the option of changing the PUB table (which indicates I/O device configuration) by adding or deleting devices. When a device is deleted (via the DEL command), all references to the device are removed. A device may be added (via the ADD command) only if sufficient space is already available in the PUB table. If a tape is to be added to the PUB table and tape-error statistics were specified during system generation, there must also be enough space for its associated tape-error block. If space is insufficient, an error message will be issued. The ADD and DEL commands are described in Operator Command Formats.

The SET command must be entered at the operator communication device. The date is required and, if the timer is supported by the Supervisor, the time of day is also required. The SET command is described in Operator Command Formats. No other information is acceptable at this time. The SET command must follow any ADD or DEL commands. When the communication device is a 1052 printer-keyboard, the end-of-block character (Ⓑ) must be given immediately after the SET command. The message: 0I20I IPL COMPLETE is printed on the printer-keyboard. Control statements can now be entered via the 1052 printer-keyboard. Ⓑ end-of-communications must be given to read control statements from SYSRDR. Three situations are possible:

1. If a permanent assignment exists for SYSRDR and it is assigned to an operative device, control statements are read from this device.

2. If a permanent assignment exists for SYSRDR and it is assigned to an inoperative device, a message is printed on the printer-keyboard. The operator can then assign SYSRDR to the device containing the control statements for the first job.

3. If a permanent assignment does not exist for SYSRDR, a diagnostic message is printed on SYSLOG.

RUNNING BACKGROUND PROBLEMS

Once the IPL procedure is complete, the first job can be run. As noted previously, all jobs are submitted by the programmer as a complete package. The operator need not be concerned with the contents of the package except for I/O assignments, removable volumes, and device setup. Each job must begin with a JOB statement and end with an end-of-job statement, /&.

The operator may have to assign symbolic units to actual physical devices. A listing of all symbolic units that must be assigned to execute IBM-supplied programs is shown in Figure 7. In this illustration, it is assumed that each of these programs is in the core image library (the library that contains the control program) and that each program has been edited to run with the control program. The EXEC statement calls the program from

the system pack into main storage for execution. A discussion of EXEC statements for each program follows.

For language translators:

// EXEC ASSEMBLY	Calls the Assembler program.
// EXEC COBOL	Calls the COBOL compiler.
// EXEC FORTRAN	Calls the FORTRAN compiler.
// EXEC RPG	Calls the RPG compiler.

For the Linkage Editor:

// EXEC LNKEDT	Calls the Linkage Editor program that edits all programs to run in the system.

For the Librarian:

// EXEC MAINT	Calls the maintenance program that catalogs (adds) elements to the system libraries, deletes elements from the libraries, renames elements in the libraries, and condenses and reallocates the libraries.
// EXEC RSERV	Calls the service program that displays (prints) and/or punches the contents of the relocatable library.
// EXEC SSERV	Calls the service program that displays and/or punches the content of the source statement library.
// EXEC CORGZ	Calls the organization program that selectively or completely copies the resident system.
// EXEC DSERV	Calls the service program that displays the content of the directories.

For Sort/Merge:

// EXEC DSORT	Calls the Disk Sort/Merge program.
// EXEC TSRT	Calls the Tape Sort/Merge program.

For Autotest:

// EXEC ATLEDT	Calls the Autotest program.

For the Utilities:

// EXEC CDPP	Calls the card-to-printer/punch program.
// EXEC CDTP	Calls the card-to-tape program.
// EXEC CDDK	Calls the card-to-disk program.
// EXEC TPCD	Calls the tape-to-card program.
// EXEC TPTP	Calls the tape-to-tape program.
// EXEC TPPR	Calls the tape-to-printer program.
// EXEC TPDK	Calls the tape-to-disk program.
// EXEC TPDC	Calls the tape-to-data-cell program.
// EXEC TPCP	Calls the tape compare program.
// EXEC DKCD	Calls the disk-to-card program.
// EXEC DKDK	Calls the disk-to-disk program.
// EXEC DKPR	Calls the disk-to-printer program.
// EXEC DKTP	Calls the disk-to-tape program.
// EXEC DKDC	Calls the disk-to-data-cell program.
// EXEC DCDC	Calls the data-cell-to-data-cell program.
// EXEC DCPR	Calls the data-cell-to-printer program.
// EXEC DCTP	Calls the data-cell-to-tape program.
// EXEC DCDK	Calls the data-cell-to-disk program.
// EXEC CLDC	Calls the clear data cell program.
// EXEC CLRDSK	Calls the clear disk program.
// EXEC VOC72UT	Calls the vocabulary file utility program for the 7772 Audio Response Unit.

Because the system operates in a stacked-job environment, processing proceeds from one job to the next until an end-of-file condition is sensed on SYSRDR (e.g., no more cards are in the control card reader). At that time, a message is printed on the printer-keyboard informing the operator of this condition. The system then enters the wait state. When the next job is ready to be processed, the operator types (B) on the printer-keyboard and system operation resumes.

If the 1052 is inoperable, two messages are printed on the printer assigned to SYSLOG: an end-of-file message and a message indicating that intervention is required on the reader assigned to SYSRDR. The system enters the wait state. To cause processing to continue, the operator must enter 01 (hexadecimal) in byte 4 of main storage and press the interrupt key on the console.

Symbolic Unit	Operand of EXEC Statement	Language Translators[1]				Linkage Editor	Autotest
		ASSEMBLY	COBOL	RPG	FORTRAN	LNKEDT	ATLEDT
SYSIPT	Required: Function: Device Type:	Always Input for program Card reader or tape unit, or disk					
SYSLOG	Required: Function: Device type:	Always Operator Communication 1052 Printer-Keyboard				Always Operator Messages 1052 Printer-Keyboard	
SYSLST	Required: Function: Device type:	Always Programmer messages, listing, etc. Printer or tape unit, or disk				No	Yes
SYSPCH	Required: Function: Device type:	If DECK specified in OPTION statement[2] Punched output Card punch or tape unit, or disk				No	No
SYSRDR	Required: Function: Device type:	Always Job Control statement input Card reader or tape unit, or disk					
SYSLNK	Required: Function: Device type:	If LINK or CATAL is specified in the OPTION statement Receive input for Linkage Editor Disk unit				Always Input Disk unit	Always Output[4] Disk unit
SYS001	Required: Function: Device type:	Always Mixed workfile Disk or tape unit[3]				Always[5] Work file Disk or tape unit	
SYS002	Required: Function: Device type:	Always Mixed workfile Disk or tape unit[3]			No	No	No
SYS003	Required: Function: Device type:	Always Mixed workfile Disk or tape unit[3]			No	No	No
SYS004	Required: Function: Device type:	No				No	No
SYS005	Required: Function: Device type:	No				No	Optional Output Tape unit

1 Either DECK or LINK, but not both, may be specified in the OPTION statement for any language translator.
2 SYSPCH is also required for the Assembler if SYM is specified in the OPTION statement.
3 If disk is used, SYS001, SYS002, and SYS003 must be disk. If tape is used, SYS001, SYS002, and SYS003 must be tape.
4 Autotest Workfile
5 For Autotest, used only by the Autotest Linkage Editor.

Figure 7. Symbolic Units Required for IBM-Supplied Programs (Part 1 of 5)

Symbolic Unit	Operand of EXEC Statement	Librarian				
		MAINT	RSERV	SSERV	DSERV	CORGZ
SYSIPT	Required: Function: Device type:	When cataloging to the relocatable or source statement library Book or module input Card reader or tape unit, or disk	No	No	No	No
SYSLOG	Required: Function: Device type:	Always Operator Messages 1052 Printer- Keyboard				
SYSLST	Required: Function: Device type:	Always Programmer Messages Printer or tape unit, or disk	Always Programmer messages and listings Printer or tape unit			
SYSPCH	Required: Function: Device type:	No	If punch function is specified Punched output. Card punch or tape unit, or disk.		No	No
SYSRDR	Required: Function: Device type:	Always Control statement input Card reader or tape unit, or disk				
SYS000	Required: Function: Device type:	No	No	No	No	No
SYS001	Required: Function: Device type:	No	No	No	No	No
SYS002	Required: Function: Device type:	No	No	No	No	Always Output Disk unit

Figure 7. Symbolic Units Required for IBM-Supplied Programs (Part 2 of 5)

Symbolic Unit	Operand of EXEC Statement	Disk Sort/Merge: DSORT	Tape Sort/Merge: TSRT	7772 Vocabulary File Utility: VOC72UT
SYSIPT	Required: Function: Device type:	Always Input for program Card reader, tape unit, or disk		Always Input for program Card reader or tape unit
SYSLOG	Required: Function: Device type:	Always Operator Messages 1052 Printer-Keyboard		Always Operator messages 1052 Printer-Keyboard
SYSLST	Required: Function: Device type:	Always Programmer Messages Printer, tape unit, or disk		Always Listings Printer or tape unit
SYSPCH		Not Used		Not Used
SYSRDR	Required: Function: Device type:	Always Job Control statement input Card reader, tape unit, or disk		Always Job Control statement input Card reader or tape unit
SYSLNK		Not Used		Not Used
SYS000	Required: Function: Device type:	Optional Input, work area, or output Disk unit	No	See Note 1
SYS001	Required: Function: Device type:	Only for tape output Input, work area, or output Disk or tape unit	Always Output Tape unit	
SYS002	Required: Function: Device type:	Only for tape input Input, work area, or output Disk or tape unit (AA)	Always Input (A) Tape unit (H)	
SYS003	Required: Function: Device type:	Optional Input, work area, or output Disk or tape unit (BB)	Always for sort, optional for merge Workfile for sort, input for merge (B) Tape unit	
SYS004	Required: Function: Device type:	Optional Input, work area, or output Disk or tape unit (CC)	Always for sort, optional for merge Workfile for sort, input for merge (C) Tape unit	See Note 2 Input Vocabulary Files Tape unit
SYS005	Required: Function: Device type:	Optional Input, work area, or output Disk or tape unit (DD)	Always for sort, optional for merge Workfile for sort, input for merge (D) Tape unit	See Note 1
SYS006	Required: Function: Device type:	Optional Input, work area, or output Disk or tape unit (EE)	Optional Workfile for sort, input for merge (E) Tape unit	
SYS007	Required: Function: Device type:	Optional Input, work area, or output Disk or tape unit (FF)	Optional Workfile for sort, input for merge (F) Tape unit	
SYS008	Required: Function: Device type:	Optional Input, work area, or output Disk or tape unit (GG)	Optional Workfile for sort, input for merge (G) Tape unit	
SYS009	Required: Function: Device type:	Optional Input, work area, or output Disk or tape unit (HH)	No	
SYS010	Required: Function: Device type:	Optional Input, work area, or output Disk or tape unit (II)	No	

Note: There are no mandatory assignments of symbolic units for DSORT with disk input/output units. Any logical unit SYSnnn may be assigned.

(A) Must be user's first input file, for merge
(B) Must be user's second input file, for merge
(C) Must be user's third input file, for merge
(D) Must be user's fourth input file, for merge
(E) Must be user's fifth input file, for merge
(F) Must be user's sixth input file, for merge
(G) Must be user's seventh input file, for merge

(H) If multi-file input with alternate drives is specified, the IOCS CLOSE routine will not switch to the alternate drive when encountering an end-of-file condition. The operator must mount the first volume of the next file on the same tape unit on which the last volume of the preceding file was mounted.

(AA) Must be user's first tape input file (FILE A)
(BB) Must be user's second tape input file (FILE B)
(CC) Must be user's third tape input file (FILE C)
(DD) Must be user's fourth tape input file (FILE D)
(EE) Must be user's fifth tape input file (FILE E)
(FF) Must be user's sixth tape input file (FILE F)
(GG) Must be user's seventh tape input file (FILE G)
(HH) Must be user's eighth tape input file (FILE H)
(II) Must be user's ninth tape input file (FILE I)

Notes.

1. SYSnnn is used as a utility workfile. SYSppp is used to record Operative Vocabulary File. SYSnnn and SYSppp are assigned unique extents in 2311 disk storage. SYSnnn is always required for Operative Vocabulary File updating. It is required for Operative Vocabulary File building only when tables are to be created. Building an Operative Vocabulary File made up of only a residuum does not require SYSnnn.

2. If the Input Vocabulary is in the form of punched cards, it can be added to the control card deck; the resulting deck is the system input file (which may be copied on a magnetic tape) to be read from SYSIPT. If the Input Vocabulary is in the form of a magnetic tape file, it must be read from SYS004 while the control statements must be read from SYSIPT.

Figure 7. Symbolic Units Required for IBM-Supplied Programs (Part 3 of 5)

Symbolic Unit	Operand of EXEC Statement	Utilities								
		Card To Printer/Punch	Card To Tape	Card To Disk	Tape To Card	Tape To Tape	Tape To Printer	Tape To Disk	Tape To Data Cell	Tape Compare
		CDPP	CDTP	CDDK	TPCD	TPTP	TPPR	TPDK	TPDC	TPCP
SYSIPT	Required: Function: Device type:	Always Utility control statement input Card reader, tape unit, or disk								
SYSLOG	Required: Function: Device type:	Always Operator Messages 1052 Printer- Keyboard								
SYSLST	Required: Function: Device type:	Always Programmer Messages Printer, tape unit, or disk								
SYSPCH		Not Used								
SYSRDR	Required: Function: Device type:	Always Job Control statement input Card reader, tape unit, or disk								
SYSLNK		Not Used								
SYS000		Not Used								
SYS001		Not Used								
SYS002		Not Used								
SYS003		Not Used								
SYS004	Required: Function: Device type:	Always Input for program Card reader			Always Tape input and alternate tape input Tape unit					Always Tape to be compared
SYS005	Required: Function: Device type:	If printed output is specified Printer	Always (A) Tape unit	Always (B) Disk unit	No	Always (A) Tape unit	Always Printer	Always (B) Disk unit	Always (C) Data cell	Always Tape to be compared
SYS006	Required: Function: Device type:	If punched output is specified Card punch	No	No	Always Card punch	No	No	No	No	No

Note: The DASD (direct access storage device) utility programs are not restricted to the use of SYS004, SYS005, and SYS006 for input or output. Any logical unit SYSnnn may be assigned.

(A) Tape output and alternate tape output
(B) Disk output and alternate disk output
(C) Data cell output and alternate data cell output

Figure 7. Symbolic Units Required for IBM-Supplied Programs (Part 4 of 5)

Symbolic Unit	Operand of EXEC Statement	Utilities										
		Disk to Card	Disk To Disk	Disk To Printer	Disk To Tape	Disk To Data Cell	Data Cell To Data Cell	Data Cell To Printer	Data Cell To Tape	Data Cell To Disk	Clear Data Cell	Clear Disk
		DKCD	DKDK	DKPR	DKTP	DKDC	DCDC	DCPR	DCTP	DCDK	CLDC	CLRDSK
SYSIPT	Required: Function: Device type:	Always Utility control statement input Card reader, tape unit, or disk										
SYSLOG	Required: Function: Device type:	Always Operator Messages 1052 Printer-Keyboard										
SYSLST	Required: Function: Device type:	Always Programmer Messages Printer, tape unit, or disk										
SYSPCH		Not used										
SYSRDR	Required: Function: Device type:	Always Job Control statement input Card reader, tape unit, or disk										
SYSLNK		Not required										
SYS000		Not required										
SYS001		Not required										
SYS002		Not required										
SYS003		Not required										
SYS004		Not required										
SYS005	Required: Function: Device type:	No	No	Always Printer	Always Ⓐ Tape unit	No	No	Always Printer	Always Ⓐ Tape unit	No	No	No
SYS006	Required: Function: Device type:	Always Card output Card punch	No	No	No	No	No	No	No	No	No	No

Note: The DASD (direct access storage device) utility programs are not restricted to the use of SYS004, SYS005, and SYS006 for input or output. Any logical unit SYSnnn may be assigned.

Ⓐ Tape output and alternate tape output
Ⓑ Disk output and alternate disk output
Ⓒ Data cell output and alternate data cell output

Figure 7. Symbolic Units Required for IBM-Supplied Programs (Part 5 of 5)

EXAMPLE OF A JOB

Figure 8 is an example of the job-control statement input required to perform a job where SYSRDR is not the same device as SYSIPT. The job illustrates a series of six job steps that includes: a FORTRAN compilation, an assembly, the execution of the combined linkage-edited output, and the execution of a program that uses subroutines kept in the relocatable library.

Each of the following items is immediately preceded by a number that corresponds to the number at the left of the job-control statements in Figure 8.

1. JOB statement for the series of job steps to be performed.

2. ASSGN statements required for the job steps. (It is assumed that these assignments differ from those currently specified in the PUB table.) The new assignments will be carried through for the entire job, and will be reset at the end of the job to the standards established during system generation (plus any permanent modifications made by the operator).

3. OPTION statement specifying that the output of the FORTRAN compilation and Assembler assembly is to be written on SYSLNK for subsequent linkage editing and that the dump option is to be exercised for an abnormal end of job.

4. EXEC statement for a FORTRAN compilation. This statement must be followed by the FORTRAN source deck and the end-of-data-file indicator (/*) when SYSIPT is the same device as SYSRDR.

5. EXEC statement for an assembly. This statement must be followed by the source deck and the end-of-data-file indicator when SYSIPT is the same as SYSRDR.

6. EXEC statement for the Linkage Editor. The Linkage Editor edits the combined FORTRAN and Assembler object programs on SYSLNK and writes the edited program temporarily in the core image library.

7. EXEC statement for the linkage-edited object program in the temporary core image library. The input data for the program execution (with end-of-data-file indicator) must follow this statement when SYSIPT is the same device as SYSRDR.

8. PAUSE statement that requests special operator action. Operator commands might also be issued at this time.

9. OPTION statement specifying that the no-dump option be exercised. The link option is included to enable a new linkage edit.

10. INCLUDE statements for modules in the relocatable library that are to be included with the object deck on SYSIPT. (The INCLUDE statement with a blank operand indicates that the program to be included follows on SYSIPT.) EXEC causes the resulting program to be edited and written in the core image library.

11. EXEC statement for the program to be executed. (The blank operand indicates that the program is in the core image library.) The data for the execution (with end-of-data-file indicator) must follow when SYSIPT is the same device as SYSRDR.

12. PAUSE statement requests operator action. Operator commands might also be issued at this time.

13. End-of-job indicator. All temporary symbolic unit assignments are reset to the standards established when the system was generated (plus any permanent modifications made by the operator). When SYSIPT is a device other than SYSRDR, a /& statement is required to indicate end-of-job in SYSIPT.

14. JOB statement for the next job.

RESTARTING A JOB

When a job is canceled before the normal end-of-job, it can be restarted immediately or at some later time. If checkpoints are not taken as part of the job, the job must be re-executed from the beginning as a new job.

If the programmer has included checkpoints in his job, the message,

0C00I CHKPT nnnn HAS BEEN TAKEN

is given each time a checkpoint is taken. To restart a job from a checkpoint, the following operations are required.

1. Replace the // EXEC statement with a // RSTRT statement (See Appendix A: Job Control Statements) using the information in the last 0C001 message received. The programmer should have specified the checkpoint unit when the job was submitted. There is no need to linkage edit the program again. When labeled multi-file tape reels are concerned, the volume sequence number must be changed to reflect the volumes for restarting if they are other than specified for volume number 1. Otherwise, a leader check error will occur when trying to open subsequent volumes for the files. All other Job Control statements should be the same as when the job was originally run. If necessary, the channel and unit addresses for the // ASSGN statement may be changed.

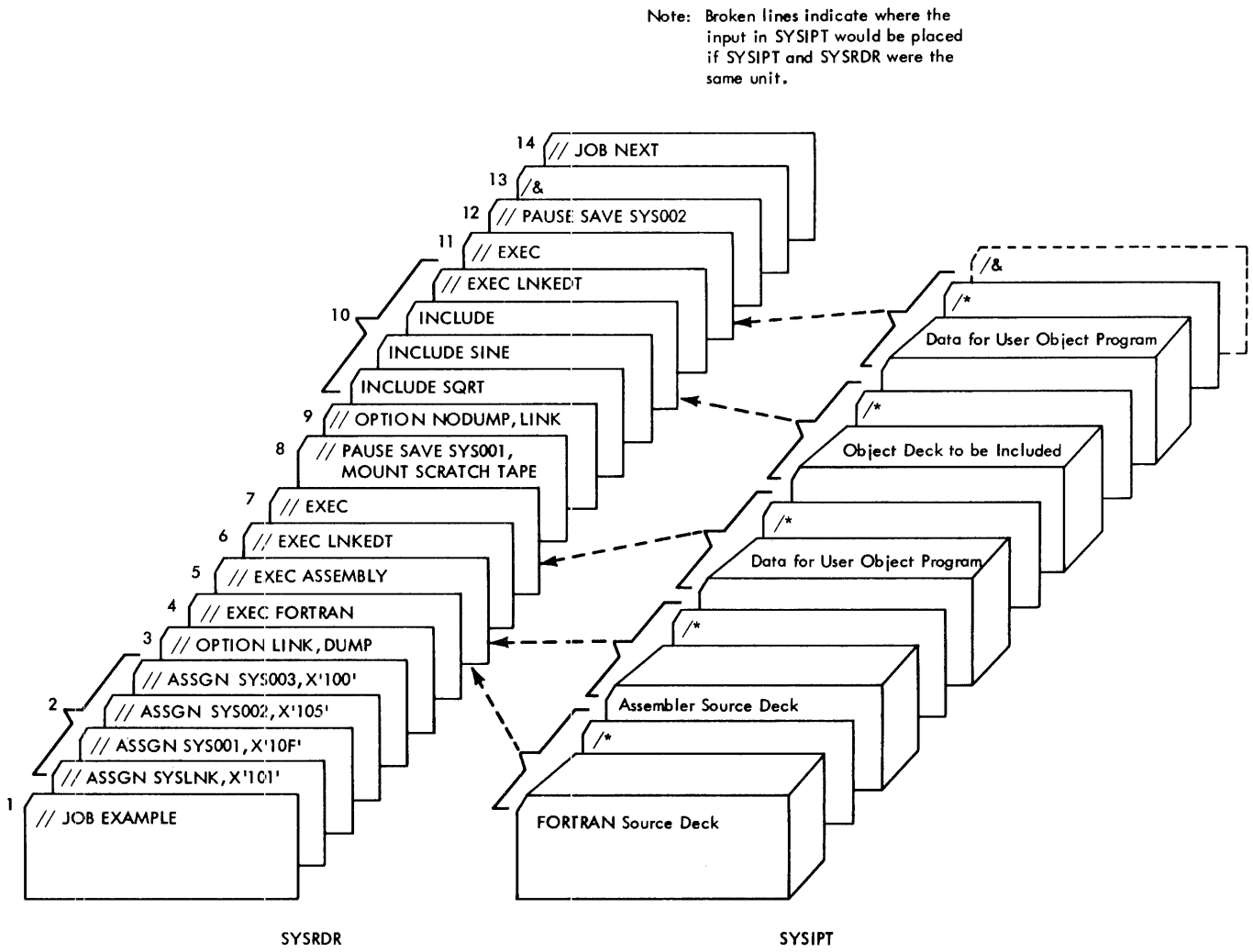


Figure 8. Example of a Job Control Statement Input

2. Rewind all tapes used by the program being restarted and mount them on devices assigned to the symbolic units required by the program.

3. Execute the job.

Note: If the Job Control statements were read from a tape or disk, the operator might not be able to restart the job conveniently. In this case, the job should be returned to the programmer.

SYSTEM OPERATION WITHOUT A 1052

Certain requirements must be met when a 1052 printer-keyboard is not available on the system:

1. A printer must be assigned to SYSLOG. Messages to the operator are printed on SYSLOG, after which an assumed operator response, where applicable, is taken. In most cases, the assumed response results in the termination of the job.

2. A printer must be assigned to SYSLST. If the same printer is assigned to both SYSLOG and SYSLST, system-to-operator messages may be embedded within user output.

3. A card reader must be assigned to SYSRDR and SYSIPT. This may be the same card reader or two different ones.

4. A card punch must be assigned to SYSPCH.

5. There are no multiprogramming

capabilities without the 1052 printer-keyboard.

When a 1052 printer-keyboard is not available, total throughput in the individual installation will suffer because jobs containing errors (such as incorrect job steps, I/O assignments) will be canceled. In many instances, such errors could be corrected by the operator, using the 1052 printer-keyboard. The operator cannot communicate with the system except to respond to certain I/O error messages. (All error messages are described in the section System-to-Operator Messages.) The message is printed on the printer assigned to SYSLOG, and the system enters the wait state. The operator must then store a response in byte 4 of main storage and press the interrupt key.

The printed message also appears in bytes 0-3. The contents of main storage bytes 0-3 are described in the Error Recovery section of the System-to-Operator Messages. If a response is required by the operator, it is always entered in byte 4 of main storage.

LINKAGE EDITING FOREGROUND PROGRAMS

Programs must be linkage edited to run at the starting boundary for the partition. (Refer to ALLOC command.) A save area is always automatically reserved at the beginning of either foreground partition by the linkage editor. This area contains the program name, return PSW, and all machine registers. Also, if labels are specified (// LBLTYP card) a label area is reserved immediately following the save area. The remaining core in the partition is available for the user's program.

An example of linkage editing a program to run in the F2 area (assume F1=16K,F2=16K in a 64K machine) follows:

```
// JOB name
// OPTION CATAL
   PHASE phasename,F+32K
```

In the preceding example, the F in the phase card signifies to the linkage editor that a foreground area is being used.

FOREGROUND PROGRAM INITIATION

Foreground programs are initiated by the operator from the printer-keyboard assigned to SYSLOG. The operator may initiate a foreground program whenever an allocated foreground area does not contain a program.

The operator initiates a foreground program by pressing the request key on the printer-keyboard. Control is given to the ATTN routine, which reads commands from the operator via the printer-keyboard.

Since the ATTN routine is called into the transient area, the request will be posted if a previous routine occupies the transient area. The START command indicates that a foreground program is to be initiated. The ATTN routine determines if the area specified in the START command is allocated and does not contain a program. If so, it transfers control to the foreground program initiation routine; otherwise, the operator is notified that he has given an invalid command.

The foreground initiator reads subsequent commands required to initiate the program. These commands are used primarily to specify I/O assignments and label information. When an I/O assignment is attempted, the following verification is made:

1. The symbolic unit is a programmer logical unit SYS000-SYS244.
2. The symbolic unit is contained within the number specified for the area when the system was generated.
3. If the symbolic unit is to be assigned to a non-DASD, the device is neither in use by the other foreground program (if applicable), nor is it assigned to a background job either as a standard, temporary, or alternate unit.

When the EXEC command is encountered, the foreground initiator directs the Supervisor to load the program to be executed into the designated foreground area. If the program has not been cataloged to the core image library, a diagnostic message will be issued on SYSLOG. If the program cannot be loaded, diagnostic messages are issued on SYSLOG for the specified foreground area.

FOREGROUND INITIATION EXAMPLES

The following examples of foreground initiation are presented for several system configurations. One of these examples shows how foreground initiation can be accomplished by using the 1052 terminal alone. Another example illustrates the same procedure when at least two card readers are available. Finally, three examples are included for installations with a single card reader.

Example 1

This procedure should be followed to initiate a foreground program at IPL time when one card reader is available and assigned to SYSIN.

1. Place the Job Control cards for the foreground program in the card reader, followed by any batch job cards.
2. Ready the reader.
3. Perform the IPL procedure with a 1052 as described under Starting the System (IPL Procedure).
4. Type:

```
ASSGN SYSIN,UA (B)
STOP (B)
```

5. Press the request key and wait for the message:

```
AR 1C60A READY FOR COMMUNICATIONS
```

6. Type:

```
START {F1} (B)
      {F2}
READ X'cuu' (B)
```

7. Wait for the foreground program to begin processing. This will occur as soon as the EXEC control statement is processed.
8. Press the request key and enter commands:

```
START BG (B)
ASSGN SYSIN,X'cuu' (B)
(B)
```

Example 2

This is an example of a planned procedure for initiating a foreground job at some time other than IPL time. One card reader is assumed to be assigned to SYSIN. If during the normal processing of background jobs, a // PAUSE statement instructs you to initiate a foreground program, the following procedure should be followed. Unless the message states otherwise, you may assume that the necessary foreground control cards are in the input job stream immediately following the // PAUSE statement.

1. Enter the following commands using the 1052 printer-keyboard.

```
ASSGN SYSIN,UA (B)
STOP (B)
```

2. Press the request key and wait for the message:

```
AR 1C60A READY FOR COMMUNICATIONS
```

3. Type:

```
START {F1} (B)
      {F2}
READ X'cuu' (B)
```

4. Wait for the foreground program to begin processing. This will occur as soon as the EXEC command is processed.
5. Press the request key and enter commands:

```
START BG (B)
ASSGN SYSIN,X'cuu' (B)
(B)
```

Example 3

This example is similar to Example 2.

- Either, you are verbally instructed to initiate a foreground job at the earliest opportunity;
- Or, an active program in either a background or foreground area issues a request to start a foreground program.

As in the case in Example 2, one card reader is assumed to be assigned to SYSIN.

1. Press the request key on the 1052 printer-keyboard and enter the following commands:

```
PAUSE (B)
(B)
```

2. WAIT for the message:

```
BG 1I00A READY FOR COMMUNICATIONS
```

   This message will appear at the completion of the current job step.
3. Run out the cards in the reader and separate the ones that have been processed from those that have not been processed.
4. Place foreground control cards in the reader, followed by the batch job cards that have not been processed.
5. Perform the steps shown in Example 2.

Example 4

This example is similar to Example 3. However, the system has two card readers.

1. Press the request key on the 1052 printer-keyboard and enter:

   START {F1 / F2} (B)

2. Type:

   LISTIO UA (B)

3. Determine which of the card readers is unassigned, and place the foreground control cards in that reader.

4. Type:

   READ X'cuu' (B)

Example 5

This example is for systems that do not have any card readers. All initiation is accomplished by using the 1052 printer-keyboard. If there are a great number of commands necessary, such as several VOL, DLAB, and XTENT statements for multiple-file processing, this method of initiation can be very time consuming. The system throughput may be greatly affected, because system processing can be continued only while the logical transient area is not being used by an active program. From the standpoint of system throughput, foreground initiation using two card readers is the most efficient method. Somewhat less desirable is initiation using a single card reader or a 1052 printer-keyboard.

1. Press the request key on the 1052 printer-keyboard and enter the following commands:

   START {F1 / F2} (B)

2. Type in programmer request control statements.

FOREGROUND PROGRAM TERMINATION

A foreground program is terminated under its own control by issuing an EOJ, DUMP, or CANCEL macro instruction, or through operator action, program error, or certain input/output failures. When a foreground program is terminated, the following action is taken:

1. All I/O operations that the program has requested are completed. If telecommunication device I/O requests are outstanding, they are terminated by the Halt I/O.

2. Tape error statistics (if specified when the system was generated) are typed on the printer-keyboard for tapes used by the program.

3. DASD extents in use by the program for purposes of DASD file protection are dequeued. (DASD file protection is an option that may be selected when the system is generated.)

4. The operator is notified that the program is completed and of the cause of termination, if abnormal. The main storage used by the program remains allocated for the appropriate foreground program area.

5. The program is detached from the system's task selection mechanism.

6. All I/O assignments are reset unless a previous HOLD command was issued for the area(s) terminated.

Following the completion of a foreground program, the operator may initiate another program for the specific area.

PRINTING MAIN STORAGE

The control program can provide an automatic printout of main storage when an abnormal end-of-job situation occurs. For the background problem area, the dump routine outputs (on the device assigned to SYSLST) the contents of the general registers and main storage from location 0 to the end of the problem program area. Because the dump routine is transient, the previous contents of the transient area of storage are destroyed. To obtain an automatic storage printout, the option DUMP must have been specified during system generation or in a previously encountered OPTION statement. Abnormal termination of a foreground program will cause a dump (on foreground unit SYS000) if SYS000 is a printer or nonfile-protected tape. In a multiprogramming environment, only the problem program area that caused the dump will be printed.

In certain cases, it is possible for the operator to cancel an abnormal dump prior to its completion. For example, if the

operator neglects to make a necessary assignment and starts a job, the job will be automatically canceled and message 0P71I will be issued. If a dump is taken, the operator can regain control prior to its completion by pressing the request key on the 1052 printer-keyboard twice. Message 1I40A, EMERGENCY CANCEL, will then be issued. The operator can reply CANCEL {BG, F1, F2} to this message, make the necessary assignment, and restart the job.

AUTOTEST DISASTER CONTINUE ROUTINE (OPERATING PROCEDURE)

Autotest is used to alter a user program and test its effectiveness by means of test requests and end-of-job storage printouts (dumps). The output of these test requests, as well as the storage dump, must be obtained if the user program does not reach its normal end of job. The procedure to accomplish this, used when other methods fail, is called disaster continue.

The machine operator should attempt to intervene manually if the user program enters an unending loop, or destroys part of the Supervisor or Autotest control program. This is done by the cancel command.

If the supervisor can accept the cancel command, Autotest functions as during an abnormal end of job. In most cases, this procedure assures that all Autotest output (up to the time of intervention) is processed. This output, along with an abnormal end-of-job dump, is put out on the unit assigned to SYSLST.

If this method is unsuccessful (program remains in loop, or supervisor is unable to cancel), the disaster continue procedure must be used to obtain the Autotest output. The purpose of the disaster continue procedure is to get a storage dump, process any Autotest output (on SYSLNK, the Autotest work file) with the normal Autotest routines, and return control to Job Control.

Disaster Continue Routine

The machine operator removes the processed cards from the input stream and:

1. Dumps main storage with a stand alone utility program. (This saves the machine condition at the time of intervention for the programmer.)

2. Performs the standard IPL procedure to restore the Supervisor.

3. Ensures that all Autotest I/O unit assignments are the same as at the time of the intervention. This is done by inserting the ASSGN cards for the user program into the job stream. (See step 4.)

   Note: If the user program utilized the same set of physical unit assignments as the installation IPL set, this would not be necessary.

4. Inserts the following cards into the input stream, followed by all cards that have not been read:

   a. A JOB control card for the user program.

   b. ASSGN cards for the user program, if needed.

   c. A disaster continue control card. The format of this card is

      ```
      // EXEC ATLECONT
      ```

   Note: If the OPTION STDLABEL was not utilized, the VOL, DLAB, and EXTENT cards for the Autotest work file must be inserted after the JOB control card (step 4a).

5. Places the remainder of cards (from the point of intervention) in the input stream.

At the conclusion of the Autotest post user execution routines, control returns to the Supervisor and normal job processing resumes with the next job.

This section describes, in chart form, the system-to-operator messages that may appear on SYSLOG. When SYSLOG is an IBM 1052 Printer-keyboard, all messages, except those that are informational, require operator response. The WAIT state is entered after issuing messages that require operator action. If an error is made in typing a response to a job control message, the operator should type (C) (alter code 0) and then the correct response.

The operator responds to messages by typing one of the following commands on the 1052 printer-keyboard: BYPASS, DELETE, DSPLYV, CANCEL, CANCELV, EOF, EOV, IGNORE, NEWTAP, NEWPAC, and RETRY, or by typing in a corrected statement. Any commands issued on the printer-keyboard may be typed in either upper or lower case letters.

When SYSLOG is a printer (because the 1052 is inoperable), the operator can reply to messages numbered 0P08A through 0P60 by storing a reply in main storage byte 4. For other messages where a reply is not possible, the Default option in the message charts shows the action (if any) taken by the system.

Each librarian message (message code 3) is preceded by the last control statement read.

If any data checks occur on a magnetic tape unit during the execution of a job (and if TEB=YES was specified during system generation), tape error statistics are printed on SYSLOG following the end-of-job statement. These statistics are printed for foreground and background areas and have the following form:

```
*** MAGNETIC TAPE ERRORS ***

CH.  UNIT PRE RDE WTE ERG NRC

 c    uu nnn nnn nnn nnn nnn
```

PRE= Permanent Redundant Read

RDE= Read Error Entry

WTE= Write Error Entry

ERG= Erase Gaps (record erased after write errors)

NRC= Noise Record Count.

To cancel a job, the operator usually should enter the command CANCEL. The message prefix determines which area will be canceled (e.g., background, foreground-one, or foreground-two). If a message is issued with the prefix AR (ATTN Routine), the cancel command must specify the area to be canceled [BG, F1, or F2].

When a background job is canceled after sensing a preceding // JOB card, the system ignores all subsequent job steps (if any) for the job being terminated, and resumes processing with the control statement following the next /& (end-of-job) statement. In all other cases, the next card is read by Job Control, and subsequent job steps preceding the next /& card are not bypassed. (Refer to CANCEL command under Operator Command Formats.)

ERROR RECOVERY

During operation, the system may enter an I/O recovery procedure from which recovery is impossible. If this occurs, the following procedure can be used by the operator to regain control from the system. An example of how such a condition could occur follows.

Assume that SYSRDR (or SYSIPT) is assigned to a tape unit and a tapemark is sensed after reading the last record in a file. The operator will be notified of this condition by a message on the 1052 printer-keyboard. If the operator responds (B) to continue processing, the system will read the next record following the tapemark. If this record cannot be read, the system will enter an I/O error recovery routine for the device, and will attempt to recover from this condition. If the system is unable to recover, the operator will again be notified of this condition by a message on SYSLOG. At this time the operator can regain control by using the following procedure.

1. Press the REQUEST key on the 1052 printer-keyboard. The message

   1I60A READY FOR COMMUNICATIONS

   will appear on SYSLOG.

2. Type:

   PAUSE (B)(B)

3. The message

   1I00A READY FOR COMMUNICATIONS

   will appear. Reassign the symbolic unit.

Byte 0 (Binary) Message	Byte 1 (BCD)	Byte 2 (Binary)	Byte 3 (Binary)	Action
00	S	Not Used	Not used	Machine Check. System must be IPL'ed. Load SEREP.
01	S	Reserved	Reserved	Channel Failure: Interface Control Check, or Channel Control Check. System must be IPL'ed. Load SEREP.
02				Reserved
03	W	Channel	Unit	DOS - Irrecoverable 2311 error during program fetch. The first six sense bytes are placed in hex Bytes 5-A. System must be IPL'ed.
04	W	Not used	Not used	Cancel condition has occurred while performing a Supervisor function. (Not a Supervisor detected problem-program error.) Normally a Program Check while in Supervisor State. System must be IPL'ed.
05	W	Channel	Unit	I/O Error Queue has overflowed as the result of an I/O error on a program fetch channel program. System must be IPL'ed.
06				Reserved
07	W	Channel	Unit	IPL I/O error. Channel and unit indicate whether SYSRES or communication device. System should be re-IPL'ed.
08-60	Action Indi-cator	Channel	Unit	Error recovery messages. Refer to 0P messages in message section.

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Action
Error message (in hex format) Example: Message 0I11A will appear in low core bytes 0-5 as F0C9F1F1C1					IPL error messages, refer to 0I messages in message section.

NO.	MESSAGE	CAUSE	ACTION	DEFAULT
0C00I	CHECK POINT NO. xxxx HAS BEEN TAKEN	Execution of indicated checkpoint has been completed.	Processing continues.	None
0C01I	NON-BATCH JOB ATTEMPTING CHKPT--CHKPT IGNORED	A foreground job in a multiprogramming environment is attempting a checkpoint.	Checkpoint ignored.	None
0C02I	CHKPT UNIT SYSxxx NOT A TAPE-CHKPT IGNORED	Unit specified for checkpoint to a tape is not assigned to a tape unit.	Checkpoint ignored.	None
0C03I	I/O REQUEST PENDING ON TELE-PROCESSING DEVICE-CHKPT IGNORED	A Tele-processing program running as a batch job has an I/O request pending on a T/P device. Tele-processing I/O can execute for an indefinite period and the checkpoint routine cannot wait for this I/O to cease.	Checkpoint ignored.	None
0C04I	END ADDRESS PARAMETER GT END PROBLEM PROGRAM AREA-CHKPT IGNORED	The end address parameter specified by the user in the CHKPT macro has a value greater than the alloted problem program area.	Checkpoint ignored.	None
0C05I	CHKPT DTFPH FILE NOT OPEN-CHKPT IGNORED	The user has not opened the DTFPH file defined for the disk unit specified in the checkpoint macro.	Checkpoint ignored.	None
0C06I	DTFPH FILE DEFINED MOUNTED=ALL-CHKPT IGNORED	The user has not specified MOUNTED=SINGLE as a parameter in the DTFPH macro for the disk unit specified in the checkpoint macro.	Checkpoint ignored.	None
0C07I	DTFPH FILE NOT DEFINED FOR OUTPUT CHKPT IGNORED	The user has not specified TYPEFLE=OUTPUT as a parameter in the DTFPH macro for the disk unit specified in the checkpoint macro.	Checkpoint ignored.	None
0C08I	CHKPT UNIT SYSxxx NOT A DISK-CHKPT IGNORED	Unit specified for checkpoint to a disk is not assigned to a disk.	Checkpoint ignored.	None
0C09I	INSUFFICIENT SPACE ALLOCATED ON DISK FILE-CHKPT IGNORED	Insufficient space allocated for a single checkpoint.	Checkpoint ignored.	None
0I00A	None. 0I00 is stored in bytes 0-3 of main storage.	A Supervisor greater than 6K bytes was used in a machine with only 16K bytes of storage. (A minimum of 32K is required.)	Restart the IPL procedure using a Supervisor that does not exceed 6K bytes of main storage.	None
0I01A	None. 0I01 is stored in bytes 0-3 of main storage.	Occurs during the IPL procedure when the operator presses the external interrupt key and no assignment exists for SYSRDR.	Restart the IPL procedure. Instead of pressing INTERRUPT on the console, press START on the card reader.	None

0I10A	GIVE IPL CONTROL STATEMENTS	IPL awaiting control commands (ADD, DEL, and SET).	Type IPL control commands on 1052.	None
Note: If the IPL communications device is a card reader and an error (0I11A-0I18A) occurs, the message number appears in main storage bytes 0-3. All low core messages have 'A' as suffix. If the communications device is a 1052, the message will be printed. The operator must restart the IPL procedure only if SYSRDR is the communications device.				
0I11A	PREVIOUS STATEMENT INVALID	Control command printed on previous line is invalid, or SET command missing	Type corrected command.	Invalid command is ignored
0I12A	DEL STATEMENT IS FOR NON-EXISTENT DEVICE	Device referred to in DEL command printed on previous line was not provided for when system was generated.	Type corrected command .	Invalid command is ignored
0I13A	CANNOT ADD PUB-- INSUFFICIENT TABLE SPACE	No room in tables to add PUB for device specified in preceding ADD command	The ADD command is ignored. It cannot be accepted unless a DEL command first releases an entry in the PUB table.	None
0I14A	CANNOT ADD TEB-- INSUFFICIENT TABLE SPACE	No room in tables to add TEB (tape error block) for device specified in preceding ADD command	The ADD command is ignored. It cannot be accepted unless a DEL command first releases a tape entry in the PUB table.	None
0I15A	PUB ALREADY EXISTS	Preceding ADD command specifies a device already provided for in PUB table.	The ADD command is ignored.	None
0I16A	NO PUB GIVEN FOR SYSRES	SET command encountered, indicating no more ADD or DEL commands, but no PUB exists for SYSRES.	Give an ADD command for SYSRES, and then reissue SET command . If using card reader for IPL, correct error and restart IPL.	None
0I17A	NO PUB GIVEN FOR SYSLOG	SET command encountered, indicating no more ADD or DEL commands. If using SYSLOG for IPL, no PUB exists for SYSLOG. If using SYSRDR for IPL no PUB exists for SYSRDR.	Give an ADD command for SYSLOG and then reissue SET command , or Give an ADD command for SYSRDR and restart the IPL procedure.	None
0I18A	SET STATEMENT NOT GIVEN	End-of-block (B) given on 1052, but no SET command was previously given.	Give SET command .	None

0I20I	IPL COMPLETE	IPL procedure is complete.	Control given to Job Control.	None
0I22I	ALLOCATION ERROR INSUFFICIENT CORE	Insufficient core to allocate the SYSGEN core specifications.	Reassemble Supervisor.	None
0I23I	DASD ON NON-FILE PROTECTED CHANNEL	1. 2311 or 2321 specified on channel where file protect coverage was not generated 2. 2321 not specified in DASD file protect option.	Delete the wrong device and reissue SET command .	None

Note: The following information pertains to messages 0P08 through 0P60. The complete format of these messages is as follows.

```
OPxxy z mmmmmmmmmm SYSxxx=cuu CCSW=ccwwwwwwwwwwwwwwww SNS=ssssssssssss CCB=aaaaaa
  SK=bbbbcccchhhh
```

The message is broken down as follows.

Format	Identification
0P	Identifies the message as being generated by physical IOCS.
xx	Message number (which also appears in byte 0 of main storage when the 1052 printer-keyboard is inoperable).
y	Action indicator.
z	Operator action.
m...m	Ten-character message indicating the specific I/O error condition.
SYSxxx	Specific logical unit on which the I/O error occurred. Appears as SYSxxx if CCB address is not available at the time the error occurred. Appears as SYSCTL whenever the logical program needs a logical unit to do an I/O command (e.g., READ).
cuu	Channel and unit on which the I/O error occurred (appears in bytes 2 and 3 when the 1052 printer-keyboard is inoperable).
cc	Command code of last CCW executed. This will appear as 00 if the CCW address is outside the user's core.
w...w	Channel status word.
s...s	Sense bytes obtained from device in error.
a...a	Address of user's CCB (will appear as zeros if unavailable at the time of the error). For unavailable or meaningless fields, the following is printed: CCSW 'NOT AVAILABLE' SNS=000000000000,CCB=000000
SK	Appears only when the error occurred on a DASD device. It is the user's seek address (bbbb will appear as BBBB if no CCB is available).

There are six possible combinations for y and z. These combinations are listed in the following table with the appropriate operator action for each combination. The operator should refer to this table for the necessary action when messages 0P08 through 0P60 are issued. Some of these messages can result in different combinations for y (action indicator) and z (operator action), depending upon the particular device responsible for issuing the message. For this reason, no y or z entry will appear with messages 0P08 through 0P60 in the message listing. However, each of these messages, when issued by the system, will always contain one of the six combinations for y and z listed in the following table. The operator action in each case is to be determined according to the following table.

y	z	ACTION	
		1052 printer-keyboard available	1052 printer-keyboard not available or SYSLOG assigned to a line printer
←		Action Indicator	
	←	Operator Action	
A		To continue 1. Perform any manual recovery procedures implied by the error condition. 2. Ready the device (no console response is required). To cancel: Press the 1052 request key and enter CANCEL {BG / F1 / F2}	Message in low core Byte 0 Message Number X'xx' 1 Action Indicator {X'C1' / C'A'} 2 Channel X'cc' 3 Unit X'uu' To continue: Perform any manual recovery procedures implied by the error condition. To cancel: Enter X'03' into byte 4 and press the interrupt key on processor.
I	I	Message is printed and error is automatically ignored. The error is posted to the program and processing may continue.	The error is posted to the program and processing may continue.
I	C	Message is printed and the job is automatically canceled.	Job is automatically canceled.
			NOTE If the action indicator is D and a 1052 printer-keyboard is not available, the operator will be unable to determine immediately if the operator action condition is I or IR. A trial-and-error approach must be followed in this case if the reply is RETRY (X'01' in byte 4). If the action condition was I, a reply of RETRY is not valid and the system will remain in the WAIT state. The operator now knows that the action condition must have been I, and can enter the correct response into byte 4 to either cancel or ignore. NOTE Message 0P60 is an exception when the operator wishes to CANCEL. For the correct action, refer to the CAUSE column for this message.

D	I	Response to messages:	Messages in low core:
		1. CANCEL 2. IGNORE --Error is ignored. The error is posted to the program and processing may continue.	Byte 0 Message Number X'xx' 1 Action Indicator {X'C4' / C'D'} 2 Channel X'cc' 3 Unit X'uu' To cancel: Enter X'03' into byte 4 and press the interrupt key on the processor. Message 0P60 is an exception when cancellation is desired. Refer to the Cause column of this message. To ignore: Enter X'02' into byte 4 and press the interrupt key on the processor. The error is posted to the program and processing may continue. NOTE: There is no way for the operator to determine if the operator action is I or IR if a 1052 is not available. Retry is not valid for I. If entered, the system will remain in the wait state. The operator should enter the correct response into byte 4 to either cancel or ignore.
D	IR	Responses to messages:	Messages in low core:
		1. CANCEL 2. IGNORE --Error is ignored. The error is posted to the program and processing may continue. 3. RETRY --Retry the channel program. 4. EOB -- Same as retry above.	Byte 0 Message Number X'xx' 1 Action Indicator {X'C4' / C'D'} 2 Channel X'cc' 3 Unit X'uu' To cancel: Enter X'03' into byte 4 and press the interrupt key on the processor. To ignore: Enter X'02' into byte 4 and press the interrupt key on the processor. The error is posted to the program and processing may continue. To retry: Enter X'01' into byte 4 and press the interrupt key on the processor.

D	R	Responses to messages:	Message in low core:
		1. CANCEL 2. RETRY --Retry the channel program. 3. EOB --Same as retry above.	Byte 0 Message Number X'xx' 1 Action Indicator {X'C4' / C'D'} 2 Channel X'cc' 3 Unit X'uu' To cancel: Enter X'03' into byte 4 and press interrupt key on the processor. To retry: Press the interrupt key on the processor.

0Pxx	y	z	MESSAGE	CAUSE
0P08			INTERV REQ	Intervention required on unit check. Device not ready. If 1052, replace the paper supply and press the request key on the 1052.
0P09			BUSOUT CHK	Unit check (parity error). The first card in the 1442 or 2520 punch must be replaced before retry.
0P10			EQUIP CHK	Unit check (equipment check for a tape unit). If 2671, see Appendix F.
0P11			DATA CHK	Unit check (data check), or tape inoperative with mode setting. If 2671, see Appendix F.
0P12			VERIFY CHK	Unit check (data check on verify command).
0P13			ADDR.MRKER	Unit check (missing address marker). The IBM 2841 Storage Control Unit has received two index points without an intervening address marker.
0P14			OVERRUN	Unit check (overrun on Channel Status Word channel chaining check).
0P15			SEEK CHK	Unit check (seek check). 1. Access mechanism has failed to reposition properly. 2. Home address compare fails after automatic head switching on a multitrack operation.
0P16			DTA CHK CT	Unit check (data check in count field).
0P17			FILE PROT	Unit check (command reject-file protect). A command that resulted in a command reject was issued to a tape that is file-protected and positioned at its load point. For a DASD file it indicates a set file mask notation. This message can be caused by an illegal seek operation. On a system with DASD file protection, it can also indicate an attempt to write on SYSRES.

0P18			COMM REJT	Unit check (command reject). Invalid CCW command or command sequence was detected. For example, an attempt was made to write on a tape with the file protection ring removed. (This tape is not positioned at load point. Otherwise, message 0P17 would be issued.)
0P19			UNDETR ERR	Unit check (no valid sense byte).
0P20			ERR ON REC	Unit check (sense operation or attempting to reposition a tape). Error occurs during device error recovery.
0P21			NRF-MADDMK	Unit check (no record found or missing address markers). or Home address or R0 cannot be found on the track.
0P22			BALST CELL	Unit check (seek check or missing address marker). or Ballast cell located (2321 only).
0P23			BLNK STRIP	Unit check (no record found or missing address marker). An uninitialized strip has been located (2321 only).
0P24			PROG CHECK Note: Sense data printed with this message is meaningless.	Channel Status Word program check. Programming error detected by channel.
0P25			PROT CHECK Note: Sense data printed with this message is meaningless.	Channel Status Word protection check. A user read command attempted to read into a main storage area outside the problem area. All problem program I/O requests are executed with the protection key (BG=1, F2=2, and F1=3).
0P26			INVAL SEEK	User-specified invalid seek address.
0P27			UNKNOWN DEVICE	Unit check. Error recovery attempted on unsupported device. This message may also appear after a BTAM job is canceled.
0P28			CHAN DTCHK	Channel Data check.
0P29			BK INTO LP	Backward command into load point on tape drive.
0P30			CONVRT CHK	Data converter check on tape.
0P31			DVC NOT OP	I/O device is not operational.
0P32			NOT COMPAT	Tape is in a mode which the drive is incapable of reading.
0P33			UCB PARITY	Bad parity in universal character buffer. Buffer must be reloaded.
0P36			NO REC FND	A no-record-found condition has occurred.
0P60			INTV RQD FOR {BG / F1 / F2}	Issued by Attention routine when a device has an operator intervention condition outstanding and the 1052 request key has been pressed. The message is issued on a program basis. If the operator cannot correct the I/O error condition(s) for the program, he must respond CANCEL to the message. The program cannot be canceled by issuing a CANCEL command following the READY FOR COMMUNICATIONS message.

NO.	MESSAGE	CAUSE	ACTION	DEFAULT
0PnnA	INVALID RESPONSE	Operator response was invalid. The number of this message is the same as the number of the message to which the invalid response was made.	Enter valid response.	Enter valid reply and press INTER-RUPT
0P70I	JOB xxxxxxxx CANCELLED DUE TO INDEFINED LOGICAL UNIT	Program issued an EXCP for a logical unit for which there is no LUB. If a dump is taken, general register 1 will contain a pointer to the CCB in question.	Job canceled.	None
0P71I	JOB xxxxxxxx CANCELLED DUE TO DEVICE NOT ASSIGNED	Program issued an EXCP for a logical unit which is not assigned to a physical device. If a dump is taken, general register 1 will contain a pointer to the CCB in question.	Job canceled.	None
0P72I	JOB xxxxxxxx CANCELLED DUE TO READING PAST /& STATEMENT	Program ignored the occur-rence of a /& (end-of-job) statement on SYSRDR or SYSIPT.	Job canceled.	None
0P73I	JOB xxxxxxxx CANCELLED DUE TO I/O ERROR	Program does not accept I/O error.	Job canceled.	None
0P74I	JOB xxxxxxxx CANCELLED DUE TO I/O OPERATOR OPTION	Operator typed CANCEL on 1052 in response to an I/O error message.	Job canceled.	None
0P75I	JOB xxxxxxxx CANCELLED DUE TO I/O ERROR QUEUE OVERFLOW	Number of I/O errors pending simultaneously has exceeded Supervisor capacity.	Job canceled.	None
0P76I	JOB xxxxxxxx CANCELLED DUE TO INVALID DASD ADDR	1. DASD file protect limits exceeded. 2. Incorrect record reference for SYSIN or (SYSLST, SYSPCH) on 2311.	Job canceled	None
0P77I	JOB xxxxxxxx CANCELLED DUE TO INVALID ADDRESS	Address parameter given by problem program refers to an address outside main storage, or outside the requester's area (background or foreground).	Job canceled.	None
0P78I	JOB xxxxxx CANCELLED DUE TO UNRECOGNIZED CANCEL-CODE	An IBM-supplied component failed to post a valid CANCEL code.	Job canceled.	None
0P79I	JOB xxxxxxxx CANCELLED DUE TO NO LONG SEEK	A DASD command chain in file protected environment does not start with a command code X'07'.	Job canceled.	None

0R00I	RESTRT UNIT NOT A TAPE OR 2311	The symbolic unit specified on // RSTRT card is not assigned to the proper device.	Job canceled.	None
0R01I	INSUFFICIENT CORE SPACE FOR PROGRAM-CANNOT RESTART	When the checkpoint was taken the program indicated a need for more main storage space than that available at restart time.	Job canceled.	None
0R02I	IMPROPER SUPERVISOR SIZE-CANNOT RESTART	Restart possible only when the supervisor is exactly the same size as when the checkpoint was taken.	Job canceled.	None
0R03I	CHECKPOINT NO. xxx NOT FOUND	The checkpoint number specified on the // RSTRT card was not found before two consecutive tapemarks were found, or before the extents were exceeded on the 2311.	Job canceled.	None
0R04I	EXTENTS FOR SYSxxx NOT EQUAL DEVICE TYPE	When the file-protect DASD extents were saved, the device type specified was different from the device type now assigned to SYSxxx.	Job canceled.	None
0R05I	NO MORE AVAILABLE JIBS	No more available JIBS could be found while restart was restoring file protect extents.	Job canceled.	None
0R06I	TAPE MARK IN DATA SYSxxx	While repositioning SYSxxx, a tapemark was found (operator may have improperly positioned tape or may have incorrectly mounted tape).	Job canceled.	None
0R10I	UNIT NOT DASD SYSxxx	The device assigned to SYSxxx, which is specified in the table of DASD devices with volume serial number written on SYSLOG, is not a DASD device.	Job canceled.	None
0R11I	INVALID BB FOR VERIFY SYSxxx	The value specified by the fifth operand in the CHKPT macro for SYSxxx is invalid.	Job canceled.	None
0R13I	DEVICE NOT A TAPE SYSxxx	SYSxxx specified for re-positioning is not a tape.	Job canceled.	None
0R14A	SER xxxxxx SEQxxxx SYSxxx	Standard label set on SYSxxx is provided for operator verification. The message indicates the serial number and the sequence number of the label found.	1. Type CANCEL to cancel job. 2. Mount new tape and type NEWTAP to continue. 3. Type IGNORE to continue with mounted reel.	Job continues with mounted reel.

0R16A	SERIAL NO. xxxxxx SYSxxx	Volume serial number of DASD device assigned to SYSxxx for operator verification.	1. Type CANCEL to cancel the job. 2. Mount new pack and type NEWPAC to continue processing. 3. Type IGNORE to continue with the mounted pack.	Job continues with mounted pack.
0S00I	JOB xxxxxxxx CANCELLED	Error in problem program caused job termination.	Job canceled.	None
0S01I	JOB xxxxxxxx CANCELLED DUE TO OPERATOR INTERVENTION	Operator typed CANCEL on 1052.	Job canceled.	None
0S02I	JOB xxxxxxxx CANCELLED DUE TO PROGRAM REQUEST	CANCEL macro instruction issued by problem program.	Job canceled.	None
0S03I	PROGRAM CHECK INTERRUPTION - HEX LOCATION nnnnnn - CONDITION CODE m - interruption cause	Program check interruption caused job termination.	Job canceled.	None
0S04I	ILLEGAL SVC - HEX LOCATION nnnnnn - SVC CODE nn Note: nn code is in hex.	When nn is 02: • The phase name given does not start with $$B. • An SVC 8 has been issued from the logical transient area, and the SVC 2 is given from the problem program area before an SVC 9 has been given. When nn is 05: • The "to" range specified in the MVCOM macro instruction is invalid. • MVCOM macro instruction was issued by a foreground program. When nn is 11: • The call was not given by a logical transient routine. When nn is a 12 or 13: • The interval timer was not allocated to this partition. • The supervisor was generated without timer option. When nn is 22, 23, or 26: • The caller did not have a PSW key of zero. This is applicable only in a multiprogramming system. When nn is 32: • For LIOCS - an imperative macro (such as WRITE or PUT) was issued to a module that does not contain the requested function.	Job canceled.	None

		• For LIOCS - an invalid ASA first character forms control character for the printer was used. • For COBOL object programs - a wrong-length record was detected. When nn is any other value: • The Supervisor function requested by the operand of the SVC is not defined for the Supervisor being used.		
0S05I	PHASE xxxxxxxx NOT FOUND	Phase named in a FETCH (SVC 1) or LOAD (SVC 4) macro instruction or referred to by an SVC 2 or 3 cannot be found.	Job canceled.	None
0S06I	JOB xxxxxxxx CANCELLED DUE TO PHASE NOT FOUND	This message is issued instead of message 0S05I when a logical transient is canceled.	Job canceled.	None
0S07I	PROBLEM PROGRAM PSW nnnnnnnnnnnnnnnn	Gives the condition of the problem program immediately before its cancelation. Message 0S07I is printed on SYSLST in conjunction with a descriptive cancellation message printed on SYSLOG.		
0S08I	LOG. TRANS. AREA CANCELLED	Indicates that the cancelation described by an associated message occurred while a logical transient was executing. This message is printed on SYSLST. Further details such as Phase name, hex location, SVC code, condition code, and interruption cause are not available when cancelation occurs in a logical transient routine.	Job canceled.	None
0S09I	JOB xxxxxxxx CANCELLED DUE TO ILLEGAL SVC.	This message is issued instead of 0S04I when a logical transient is canceled.	Job canceled.	None
0S10I	PROGRAM xxxxxxxx COMPLETED	Message issued at the normal completion of a foreground program.	Job completed.	None
0S11I	JOB xxxxxxxx CANCELLED DUE TO PROGRAM CHECK	This message is issued instead of 0S03I when a logical transient is canceled.	Job canceled.	None

Note: Some Job Control messages in the following list specify an n as the third message digit, where n can have any value between 1 and 9. For these messages, the n specifies the field being processed when the error was detected. It does not necessarily indicate the field in error.

Example: If an ASSGN statement with the following format were being processed,

```
// ASSGN SYSRDR,IGN
```

message number 1A04D would be issued. The number 4 indicates that the fourth field in the ASSGN statement was being processed when the error was detected. If the following ASSGN command was issued instead,

```
ASSGN SYSRDR,IGN
```

message 1A03D would be issued.

NO.	MESSAGE	CAUSE	ACTION	DEFAULT
1A0nD	INVALID I/O ASSIGNMENT	1. Previous ASSGN specified invalid logical or physical unit. 2. Previous ASSGN attempted to assign the ignore parameter to SYSRDR or SYSIPT. 3. Previous ASSGN attempted to make a temporary assignment to SYSPCH or SYSLST when the system was in the SYSOUT mode. 4. Previous ASSGN attempted to make an alternate assignment to a logical unit currently unassigned. 5. Previous ASSGN attempted to make an alternate assignment to SYSOUT when the system was not in SYSOUT mode. 6. Previous ASSGN attempted to make a temporary alternate assignment to a logical unit whose mode is standard. 7. Previous ASSGN attempted to make a standard alternate assignment to a logical unit whose mode is temporary.	1. Type in new assignment. 2. Type CANCEL to cancel job. 3. Type IGNORE to ignore assignment.	Invalid assignment is ignored.
1A1nD	CONFLICTING I/O ASSIGNMENT	1. Previous ASSGN attempted to assign a logical unit to a physical device already assigned to a conflicting function. For example, no physical device can be assigned to both SYSOUT and SYSIN. 2. Previous ASSGN attempted to assign a logical unit to a physical device assigned to another program.	1. Type in a new assignment. 2. Type CANCEL to cancel job. 3. Type IGNORE to ignore the assignment.	Invalid assignment is ignored.

A2nD	INVALID DEVICE TYPE	Logical function inconsistent with physical device type. For example, SYSRDR assigned to a printer	1. Type in new assignment. 2. Type CANCEL to cancel job. 3. Type IGNORE to ignore the assignment.	Invalid assign-ment is ignored.
A3nD	NO FREE JIBS	Too many alternate units or temporary assignments have been made.	Use LISTIO command to get listing of assign-ments, and 1. Make standard assignments for temporary assignments or 2. Type in a new ASSGN command or 3. Type CANCEL to cancel job or 4. Type IGNORE to ignore the statement.	Statement is ignored.
A4nD	INVALID LOGICAL UNIT SPECIFICATION	The previous statement contained a logical unit that was invalid. This could result from: 1. Format error 2. The order of the unit is greater than the number of LUB's contained in the class. For example, SYS021 is specified when space has been allocated for 21 logical units.	1. Type in the correct logical unit. 2. Type CANCEL to cancel job 3. Type IGNORE to ignore the statement.	Invalid statement is ignored.
A5nD	DEVICE NON-EXISTENT	The physical unit X'cuu' specified in the previous statement was not added at IPL or system generation time.	1. Type the statement with a different physical unit. 2. Perform a new IPL and add the physical unit. 3. Type CANCEL to cancel job. 4. Type IGNORE to ignore the statement.	Statement is ignored.
A6nD	UNIT CURRENTLY UNASSIGNABLE	• The previous ASSGN attempted to assign SYSLOG while a foreground program was active in the system. • A UNA command was issued to an active foreground program.	1. Type IGNORE to ignore the assignment. 2. Type CANCEL to cancel job. 3. Wait until fore-ground job is complete and resubmit assignment.	Assign-ment is ignored.

1A7nD	INVALID DEVICE STATUS	1. The previous ASSGN attempted to assign a physical unit that is in a "down" status resulting from a DVCDN command 2. The previous ASSGN attempted to assign SYSLST or SYSPCH to a file-protected tape. 3. The device specified in the DVCUP command was never previously placed in a down status by a DVCDN command. 4. The previous MTC command specified a physical device assigned to a foreground program.	1. Type in a new assignment. 2. Type IGNORE to ignore the statement or command 3. Type CANCEL to cancel job.	Invalid statement or command is ignored.
1A80D	SYSTEM FILE OPEN FAILURE	The previous assignment failed to open.	The logical unit has been unassigned by the IBM Supervisor. 1. Type a new assignment. 2. Type IGNORE to continue. 3. Type CANCEL to cancel job. 4. Submit new label information to correct the failure and resubmit the assignment.	None
1A9nD	SYSTEM FILE NOT CLOSED	The previous ASSGN attemped to assign a system unit before closing the unit.	1. Use the CLOSE command with its optional operand to close and assign the logical unit. 2. Type IGNORE to ignore the assignment. 3. Type CANCEL to cancel job.	Assignment is ignored.
1C00A	ATTN. c uu	A unit exception has been detected on the specified channel and unit.	If unit is a card reader: Refill the reader and type IGNORE to continue processing, or Reassign unit to a tape or disk or another card reader. If unit is a tape or disk: Type IGNORE to read the next record or Mount a new tape or disk and reassign the same unit or assign another unit or Type CLOSE SYSLST and either mount a new tape and reassign the same unit, or assign another unit.	Condition is ignored.

1210A	PLEASE ASSIGN {SYSRDR / SYSIPT / SYSLNK}	1. A statement or command was to be read from SYSRDR and it is not assigned. 2. An INCLUDE statement with no operand was found and SYSIPT is not assigned. 3. A // OPTION CATAL or LINK was detected and SYSLNK is not assigned.	1. Assign SYSRDR and reply Ⓑ. 2,3 Assign logical unit to proper device and resubmit statement.	Assign-ment is ignored.
1220D	READ UNIT NOT DEFINED	During foreground initiation, a response of B was given on the 1052 before issuing a READ command.	1. Submit READ command and reply Ⓑ 2. Continue with initiation statement on SYSLOG	None
1230A	PROGRAM NOT FOUND	The phase name specified on the EXEC command or statement is not in the core image library.	Correct command or statement, or Type CANCEL to cancel job or initiation.	Job canceled.
1240I	NO ROUTINE LINKAGE	1. An external interrupt was given and no STXIT was supplied in background job. 2. The MSG command was given and no STXIT was supplied for the referenced foreground area.	1. Type MSG command again for proper area. 2. Retry procedure after STXIT is given.	Interrupt or command is ignored.
1250I	PROCESSING ROUTINE ACTIVE	1. External interrupt given and background external interrupt routine is currently active. 2. MSG command given and foreground area external interrupt routine is active.	Wait for external interrupt routine to become inactive and retry procedure.	Interrupt or com-mand is ignored.
1260D	TIMER NOT AVAILABLE	The TIMER command was issued and the timer feature is not present or The timer feature is now in use by another program area.	If timer feature is not present command is ignored. Otherwise, wait for timer feature to become inactive and resubmit job.	Command is ignored.
1270D	nnnnn RECORDS REMAINING ON {SYSPCH / SYSLST}	The minimum number of remaining records on the DASD device assigned to the logical unit specified at system generation with SYSFIL or specified at SET time (with RCLST or RCPCH) has been reached or exceeded during the previous job. nnnnn tells how many record spaces now remain.	1. Submit new XTENTs, CLOSE file, and reassign file to the device containing the new extents. 2. CLOSE and reassign to non-DASD device. 3. Type IGNORE to continue processing.	The condition is ignored until the next entry.
1280D	END of EXTENT ON {SYSRDR / SYSIPT / SYSPCH / SYSLST / SYSLNK}	End of extent has been reached on the specified logical unit. Note: End of extent on SYSLNK requires that all preceding linkage editor control statements (including // OPTION CATAL or LINK) be resubmitted.	1. Submit new XTENT's, CLOSE the logical unit, and reassign the file to the device containing the new extents. 2. CLOSE the logical unit and reassign the file to a non-DASD device.	None

1C90A	NEW SUPERVISOR CATALOGED RE-IPL TO CONTINUE	Self-explanatory	Re-IPL to continue.	None
1I00A	READY FOR COMMUNI-CATIONS	Either PAUSE command was issued or SYSLOG was in use as the communications device when the last // EXEC was given.	Enter any valid command or statement.	None
1I10I	ASSIGNMENTS RELEASE	All assignments to the physical device X'cuu' specified in the DVCDN command have been released.	All assignments are reset to an unassigned status.	None
1I20I	JOB xxxxxxxx CANCELLED DUE TO OPERATOR INTERVENTION	The CANCEL command was given to Job Control.	None	None
1I32D	AREA NOT ACTIVE	The attention routine CANCEL command was given and specifies an inactive area.	Submit CANCEL command for proper area or Reply Ⓑ to continue processing if initiation is not in progress or If initiation in progress, type CANCEL or continue with initiation.	Command ignored.
1I40D	EMERGENCY CANCEL	Operator had made a second attention request before the first request could be honored.	Respond with CANCEL command for the proper area (BG, F1, F2) or Type Ⓑ to ignore message. The original request remains pending.	Job is canceled.
1I50I	JOB xxxxxxxx CANCELLED DUE TO END OF EXTENT ON SYSLNK	Self-explanatory	Job canceled.	None
1I60A	READY FOR COMMUNI-CATIONS	The operator pressed the REQUEST key.	Enter any valid command	None
1L04A	INVALID LABEL SET ON cuu	Label on the tape on the channel and unit specified (cuu) is neither an IBM-standard label nor a file mark.	a. Mount a new tape and type RETRY to continue processing. b. Type IGNORE to generate a label and continue processing. The label generated is a file mark if the first record was not VOL1, or a HDR1 record with 72 binary zeros	Job canceled.

			followed by a tapemark if the first record following the volume record was not HDR1.	
1L05A	ACTIVE FILE ON cuu	Label on the channel and unit specified (cuu) has an unexpired date.	a. Mount a new tape and type RETRY to continue processing. b. Type IGNORE to ignore the condition and continue processing. The HDR1 record will be replaced by an HDR1 record with 72 binary zeros followed by a tapemark.	Job canceled.
1L06A	INVALID RESPONSE	Operator typed an invalid response.	Type a valid response.	None
1L07A	FILE PROTECTED OUTPUT FILE ON cuu	The tape on the channel and unit specified (cuu) for use as an output file is file-protected.	Mount a non-file protected tape and type RETRY to continue processing.	Job canceled.
1L0nD	INVALID LABEL SYNTAX	1. Expiration date less than creation date in DLAB statement. 2. In XTENT statement: a. Type operand in XTENT and DLAB conflict. b. Type and sequence number operands in XTENT conflict. 3. Lower and upper BIN numbers are not equal. 4. The upper limit exceeds the maximum allowable amount. 5. Lower limit is greater than upper limit. 6. For split XTENT's (type 128) lower head number is greater than upper head number. 7. Sequence number exceeds 255. 8. Lower or upper XTENT is zero.	Correct invalid statement or Type CANCEL to cancel initiation or job or Type IGNORE to continue processing.	None
1L1nD	LABEL AREA EXHAUSTED	1. Insufficient core allocated for label storage. 2. Disk label space is exhausted.	Type CANCEL to cancel initiation or job.	None
1P0nD	INVALID ALLOCATION	An allocation was attempted that 1. Would cause an active background or foreground area to be reduced or result in less than 10K for the background. 2. Would take core from the background area currently in use for label storage. 3. Would cause the relocation of an active program. 4. ATTN routine allocation was attempted that would decrease the background area.	Type valid allocation command.	Invalid command is ignored.

1P1nD	AREA NOT AVAILABLE	1. A START command was given that specified an active foreground area. 2. No foreground area has been allocated.	Specify another area or Type CANCEL to cancel initiation.	Command is ignored.
1S0nD	INVALID STATEMENT	The referenced field (n) is invalid (i.e., misspelled, wrong size, non-numeric character in numeric field). This message can also appear if a command is given at the wrong time (e.g., ASSGN issued in ATTN routine).	Correct statement or command in error (through 1052 or SYSRDR), or Type CANCEL to cancel job initiation, or Type IGNORE to continue processing.	Invalid statement or command is ignored.

1S1nD	STATEMENT OUT OF SEQUENCE	Label statement submitted in wrong order,
		or
		XTENT sequence number out of order,
		or
		PHASE, ACTION, ENTRY, or INCLUDE encountered without a preceding LINK or CATAL option
		or
		// EXEC LNKEDT encountered and LINK or CATAL option flag is not on
		or
		Incomplete label set (i.e.,VOL or VOL and DLAB only) when either /& was encountered while in STDLBL mode, or
		// EXEC encountered while in either STDLBL or USRLBL mode
		or
		// OPTION LINK encountered when the CATAL option was previously specified
		or
		Label type not DASD, SD, or TAPE while operating in STDLBL mode
		or
		More than one extent submitted for a file with filename=IJSYSxy, where x is numeric.
		or
		// EXEC encountered after an Autotest ./ ATEOF card. In this case, n = 3.
		or
		During FORTRAN or COBOL compilation, serious errors were detected and the system will not allow linkage editing.
			Correct statement in error,
			or
			Type CANCEL to cancel job or initiation,
			or
			Type IGNORE to continue processing.
				Statement ignored.

Note: Statements in error (messages 2100I to 2170I) are printed in the following formats.

1. If there is no 12-2-9 code in column 1 of the card image, columns 2-80 of the card image are printed in EBCDIC.
2. If there is a 12-2-9 code in column 1 of the card image:

Print Positions	Contains Card Image Columns
8-15	73-80 (identification) in EBCDIC
17-19	2-4 (card type) in EBCDIC
21-26	6-8 (assembled origin) in hexadecimal
28-31	11-12 (number of bytes in card image) in hexadecimal
33-36	15-16 (ESID number) in hexadecimal

The remainder of the line depends on the type of card image (ESD or non-ESD).

a. If non-ESD type card image, print positions 38-128 are printed from columns 17-52. These positions are printed in hexadecimal in blocks of 9 words (36 bytes) separated by one block.
b. If ESD type card image, print positions 38-128 contain 3 fields of ESD information. Each field is 16 columns, which are as follows:

Columns	Contains
17-24	ESD item name in EBCDIC
25	ESD type in EBCDIC
26-28	Assembled origin in hexadecimal
30-32	Length/ESD number in hexadecimal

The action taken by the system when these messages are issued depends upon the option specified in the Linkage Editor ACTION statement. If CANCEL is specified as the operand of the ACTION statement, the job will be canceled. If CANCEL is not specified in the ACTION statement, processing continues.

NO.	MESSAGE	CAUSE
100I	Content of statement in error.	Invalid input card type.
101I	Content of statement in error	Invalid operation in control statement.
102I	Content of statement in error	Non-decimal or non-hexadecimal character in decimal or hexadecimal field.
110I	Content of statement in error.	Invalid or missing field limiter on control statement.
111I	Content of statement in error.	An operand field is greater than the maximum length on a user-prepared control statement or REP card.
112I	Content of statement in error.	An operand field is missing.
113I	Content of statement in error.	Control statement extends beyond column 71.
114I	Content of statement in error.	Submodular namelist is too long.
115I	Content of statement in error.	NOAUTO expected, but not found.
116I	Content of statement in error.	Control statement present between first ESD and END statements of a module.
120I	Content of statement in error.	Phase name duplicated.
121I	Content of statement in error.	Phase name lower in sequence than $$A or phase name begins with an *.

2122I	Content of statement in error.	Symbol or phasename designated in origin was not previously defined.
2123I	Content of statement in error.	Previous phase processed contained no valid storage assignment.
2124I	Content of statement in error.	Phase origin is negative.
2125I	Content of statement in error.	PHASE statement encountered during AUTOLINK.
2130I	Content of statement in error.	Relocatable library not present.
2131I	Content of statement in error.	Module requested by INCLUDE statement not present in relocatable library.
2132I	Content of statement in error.	Too many nesting levels of INCLUDE attempted.
2133I	Content of statement in error.	Nested submodular INCLUDE.
2135I	Content of statement in error.	ACTION statement has invalid operand.
2136I	Content of statement in error.	ACTION MAP specified, but SYSLST was not assigned.
2140I	Content of statement in error.	ESD item of invalid type.
2141I	Content of statement in error	Duplicated ESID number: 1. No END statement in last module. 2. Duplicate ESD cards. 3. Extraneous ESD card.
2142I	Content of statement in error.	ESD entry point label does not point to ESD named control section or COMMON.
2143I	Content of statement in error.	Invalid duplication of entry point label.
2144I	Content of statement in error.	Invalid ESID number, or control dictionary and linkage table overlap.
2145I	Content of statement in error.	Origin of control section not on a doubleword boundary.
2146I	Content of statement in error.	COMMON has the same label as a named control section or an entry point label.
2147I	Content of statement in error.	ESD entry point label does not belong to a defined control section.
2150I	Content of statement in error.	Load address encountered outside phase.
2151I	Content of statement in error.	Invalid delimiter on REP card.
2155I	Content of statement in error.	The TXT or REP card or address constant in an RLD record does not have an ESID pointer to a defined control section.
2156I	Content of statement in error.	Invalid format of RLD card.
2158I	Content of statement in error.	END statement should contain the length of the control section, but does not.
2170I	Content of statement in error.	ESID number not previously processed.

NO.	MESSAGE	CAUSE	ACTION	DEFAULT
2181I	LINKAGE EDITOR CANNOT CONTINUE	No valid storage assignment in final phase.	Job canceled.	None.
2182I	LINKAGE EDITOR CANNOT CONTINUE	No END record encountered before ENTRY statement.	Job canceled.	None.
2185I	LINKAGE EDITOR CANNOT CONTINUE	An error occurred during the linkage editing of a $ phase.	Job canceled.	None.
2191I	LINKAGE EDITOR CANNOT CONTINUE	1. End of file or extents exceeded on SYS001. 2. SYS001 not assigned to disk or tape.	Job Canceled.	None.
2192I	LINKAGE EDITOR CANNOT CONTINUE	End of librarian work area. Too many phases to process.	Job canceled.	None.
2193I	LINKAGE EDITOR CANNOT CONTINUE	Core image library space exceeded.	Job canceled.	None.
2194I	LINKAGE EDITOR CANNOT CONTINUE	Disk error -- an invalid no-record-found condition occurred.	Job canceled.	None.
2195I	LINKAGE EDITOR CANNOT CONTINUE	Multiprogramming in process while attempting to linkage edit and catalog a new Supervisor.	Job canceled.	None.
2199I	ERROR HAS OCCURRED DURING LINKAGE EDITING	Printed on SYSLOG if any errors 2100I through 2170I have occurred. These messages appear on SYSLST.	Job canceled.	None.

NO.	MESSAGE	CAUSE	ACTION	DEFAULT
3C10I	INVALID CONTROL CARD	Message printed on SYSLST. Card read is not ALLOC, COPY COPYC, COPYR, or COPYS.	Processing continues.	None.
3C20I	ALLOCATION SPECIFIED TWICE FOR THE ------ LIBRARY	Message printed on SYSLST. More than one ALLOC statement received for this library.	Processing continues.	None.
3C21I	INVALID OPERAND	Message printed on SYSLST. The operand in an ALLOC or COPY-type statement is invalid.	Processing continues.	None.
3C30I	CARD OUT OF ORDER	Message printed on SYSLST. ALLOC card receiver after COPY, COPYC, COPYR, or COPYS card.	Processing continues.	None.
3C33I	----- NOT IN LIBRARY	Message printed on SYSLST. The name requested is not found in the requested library.	Processing continues.	None.
3C40I	NO {CORE IMAGE / RELOCATABLE / SOURCE STATEMENT} LIBRARY ALLOCATED	Message printed on SYSLST. A request was made of a library but no library is available.	Processing continues.	None.
3C60I	{CORE IMAGE / RELOCATABLE / SOURCE STATEMENT} LIBRARY ALLOCATED BUT NO DIRECTORY	Message printed on SYSLST. An allocation for the library was received, but not for the directory.	Processing continues.	None.
3C61I	ZERO ALLOCATION SPECIFIED FOR CORE IMAGE LIBRARY	Message printed on SYSLST. No allocation for the Core Image Library was received.	Processing continues.	None.
3C62I	TRACKS EXCEED CYLINDERS IN {CORE IMAGE / RELOCATABLE / SOURCE STATEMENT} LIBRARY	Message printed on SYSLST. The number of tracks allocated for the directory exceeds the total cylinder allotment for the directory/library.	Processing continues.	None.
3C63I	{CORE IMAGE / RELOCATABLE / SOURCE STATEMENT} DIRECTORY OVERFLOW	Message printed on SYSLST. Insufficient number of tracks have been allocated for this directory.	Processing continues.	None.

C64I	{CORE IMAGE / RELOCATABLE / SOURCE STATEMENT} LIBRARY OVERFLOW	Message printed on SYSLST. Insufficient number of cylinders have been allocated for this library.	Processing continues.	None.
C65I	INVALID EXTENTS DEFINED FOR SYS002	Message printed on SYSLST. The extents defined do not cover the entire file.	Processing continues.	None.
C66I	FILE IJSYSRES NOT DEFINED ON SYS002	Message printed on SYSLST. The file IJSYSRES has been defined, but not on SYS002.	Processing continues.	None.
D10D	INVALID OPERATION	Operation field of control statement contains something other than DSPLY.	a. Type IGNORE to continue processing. b. Type CANCEL or Ⓑ to cancel.	Job canceled.
D20D	INVALID OPERAND	Operand field of control statement contains something other than CD, RD, SD, TD, or ALL.	a. Type IGNORE to continue processing. b. Type CANCEL or Ⓑ to cancel.	Job canceled.
D43I	RELOCATABLE LIBRARY HAS NO ENTRIES	Message printed on SYSLST. 1. No active entries in relocatable library, or 2. No relocatable library is present on the disk and either RD or ALL appeared in the control statement.	Processing continues.	None.
D47I	SOURCE STATEMENT LIBRARY HAS NO ENTRIES	Message printed on SYSLST. 1. No active entries in source statement library, or 2. No source statement library is present on the disk and either SD or ALL appeared in the control statement.	Processing continues.	None.
E10D	INVALID OPERATION	Operation field of control statement contains something other than CATALR, CATALS, DELETC, DELETR, DELETS, RENAMC, RENAMR, RENAMS, IPTCTRL, RDRCTRL, CONDS, or ALLOC.	a. Type IGNORE to bypass statement and continue processing. b. Type CANCEL or Ⓑ to cancel.	Job canceled.
E11D	INVALID CARD IN MODULE	Module to be cataloged in relocatable library contains invalid statement. The last statement read is the statement in error.	a. Type IGNORE to bypass module and continue processing. b. Type CANCEL or Ⓑ to cancel.	Job canceled.
E20D	INVALID OPERAND	Blank or invalid operand field following a CATALR or CATALS statement.	a. Type IGNORE to continue processing. b. Type CANCEL or Ⓑ to cancel.	Job canceled.

3M21I	INVALID OPERAND	Message printed on SYSLST. Blank operand field following DELETC, DELETR, DELETS, RENAMC, RENAMR, or RENAMS statement.	Processing continues.	None.
3M22I	PHASE*** INVALID PHASE NAME - PROGRAM NOT CATALOGED	Message printed on SYSLST. Name of phase to be cataloged is in error or is not given in a PHASE statement. The program containing the phase is not cataloged in the core image library.	Processing Continues	None.
3M23D	xxxxxxxx INVALID OPERAND-BKEND OPERAND n	BKEND statement contains invalid entry xxxxxxxx as operand n within the statement	a. Type IGNORE to bypass this book and continue processing. b. Type CANCEL or Ⓑ to cancel.	Job canceled.
3M24I	xxxxxxxx { CATALOGED / DELETED / RENAMED } IN SUBLIBRARY x	Message printed on SYSLST. Book xxxxxxxx was missing its sublibrary identification (A for Assembler; C for COBOL) and was cataloged/deleted/renamed in sublibrary x (A or C).	Processing continues.	None.
3M25D	ERROR IN CARD SEQUENCE NO. CARD NO. xxxxx	Card xxxxx out of sequence in book to be cataloged in source statement library.	a. Type IGNORE to bypass this book and continue processing. b. Type CANCEL or Ⓑ to cancel.	Job canceled.
3M26D	ERROR IN CARD COUNT-ACTUAL COUNT xxxxx	Card count xxxxx in the BKEND statement does not correspond to actual count of cards, including BKEND statements.	a. Type IGNORE to bypass this book and continue processing. b. Type CANCEL or Ⓑ to cancel.	Job canceled.
3M33I	xxxxxxxx NOT IN LIBRARY	Message printed on SYSLST. The phase, module, or book to be deleted or renamed did not exist in the library.	Processing continues.	None.
3M34I	EOF ON SYSIPT--END STATEMENT MISSING	Message printed on SYSLST. Module to be cataloged did not have an END statement.	Processing continues.	None.
3M35D	NO HEADER BKEND OR MACRO STATEMENT	First statement of book to be cataloged in source statement library is not a BKEND or MACRO statement.	a. Type IGNORE to bypass book and continue processing. b. Type CANCEL or Ⓑ to cancel.	Job canceled.

3M43I	NO {RELOCATABLE / SOURCE STATEMENT} LIBRARY	Message printed on SYSLST. The library called for does not exist.	Processing continues.	None.
3M52I	{RELOCATABLE / CORE IMAGE / SOURCE STATEMENT} DIRECTORY IS FULL	Message printed on SYSLST. Not enough space in directory when trying to catalog.	Processing continues.	None.
3M53I	{RELOCATABLE / SOURCE STATEMENT} LIBRARY IS FULL	Message printed on SYSLST. Not enough space for new entry in library when trying to catalog.	Processing continues.	None.
3M54I	xxxxxxxx ALREADY IN LIBRARY	Message printed on SYSLST. The phase, module, or book to be renamed is already in the library.	Processing continues.	None.
3M60I	ZERO ALLOCATION SPECIFIED FOR CORE IMAGE LIBRARY	Message printed on SYSLST. Allocation of zero cylinders was made for the core image library in the ALLOC statement.	Processing continues.	None.
3M61I	INVALID ZERO ALLOCATION	Message printed on SYSLST. Only one of a pair of parameters is zero.	Processing continues.	None.
3M62I	TRACKS FOR DIRECTORY EXCEED CYLINDERS FOR LIBRARY	Message printed on SYSLST. Number of tracks specified for a directory is greater than the number of tracks contained in the cylinders specified for the corresponding library.	Processing continues.	None.
3M63I	{CORE IMAGE / RELOCATABLE / SOURCE STATEMENT} DIRECTORY ALLOCATION IS TOO SMALL	Message printed on SYSLST. Specified allocation is too small to contain information existing in {Core Image / Relocatable / Source Statement} directory.	Processing continues.	None.
3M64I	{CORE IMAGE / RELOCATABLE / SOURCE STATEMENT} LIBRARY ALLOCATION IS TOO SMALL	Message printed on SYSLST. Specified allocation is too small to contain information existing in {Core Image / Relocatable / Source Statement} library.	Processing continues.	None.

3M65I	ALLOCATION EXCEEDS SYSRES EXTENT	Message printed on SYSLST. Parameter on ALLOC statement requires a larger extent than provided by XTENT card for SYSRES.	Processing continues.	None.
3M66I	BEGIN REALLOCATION	Message printed on SYSLST. System is not operable until reallocation is finished.	Processing continues.	None.
3M67I	END REALLOCATION	Message printed on SYSLST. Reallocation is finished and system is now operable.	Processing continues.	None.
3M68I	STATEMENT IGNORED DUE TO MULTIPROGRAMMING IN PROGRESS	User asked for condense or reallocation of core image library while multiprogramming was in progress.	Wait for F1 or F2 to complete and retry the statement.	None
3M69I	STATEMENT IGNORED DUE TO CONTROL PROGRAM BEING CATALOGED	User asked for condense or reallocation of core image library after cataloging the Supervisor in the same job.	Submit the condense as a separate job.	None
3M70A	POTENTIAL DISASTER ERROR. REBUILD SYSTEM.	Disk error on SYSRES.	Wait state is entered. System must be rebuilt.	Wait state entered. System must be rebuilt.
3M80I	CORE IMAGE LIBRARY BEING CONDENSED	Condense of core image library in process.	Processing continues.	None
3M81I	RELOCATABLE LIBRARY BEING CONDENSED	Condense of relocatable library in process.	Processing continues.	None
3M82I	SOURCE STATEMENT LIBRARY BEING CONDENSED	Condense of source statement library in process.	Processing continues.	None
3R10D	INVALID OPERATION	Operation field of control statement contains something other than DSPLY, PUNCH, or DSPCH.	a. Type IGNORE to continue processing. b. Type CANCEL or Ⓑ to cancel.	Job canceled.
3R21I	INVALID OPERAND	Message printed on SYSLST. Operand field of control statement contains something other than a valid entry. Valid operands are: an alphameric module name, and ALL.	Processing continues.	None.
3R27I	xxxxxxxx NOT IN LIBRARY	Message printed on SYSLST. Module xxxxxxxx is not present in the relocatable library.	Processing continues.	None.

3R43I	NO RELOCATABLE LIBRARY	Message printed on SYSLST. 1. A relocatable library is not defined on the disk pack, or 2. The relocatable library contains no active entries.	Processing continues.	None.
3R44I	RELOCATABLE LIBRARY HAS NO ACTIVE ENTRIES	Self-explanatory	Job canceled.	None
3S10D	INVALID OPERATION	Operation field of control statement contains something other than DSPLY, PUNCH, or DSPCH.	a. Type IGNORE to continue processing. b. Type CANCEL or Ⓑ to cancel.	Job canceled.
3S21I	INVALID OPERAND	Message printed on SYSLST. Operand field of control statement contains something other than a valid entry. Valid operands are the sublibrary name (A for Assembler and C for COBOL) followed by a period and the book to be operated upon, the sublibrary name followed by a period and ALL, and CMPRSD as the last operand of the statement.	Processing continues.	None.
3S33I	x.xxxxxxxx NOT IN LIBRARY x. ALL NOT IN LIBRARY	Message printed on SYSLST. 1. Book xxxxxxxx in sublibrary x not present in the source statement library. 2. Sublibrary x not present in source statement library.	Processing continues.	None.
3S43I	NO SOURCE STATEMENT LIBRARY	Message printed on SYSLST. 1. A source statement library is not defined on the disk pack, or 2. The source statement library contains no active entries.	Processing continues.	None.
xnnD	RESPOND WITH CANCEL OR IGNORE	Operator made an invalid response on 1052 (something other than IGNORE, CANCEL or Ⓑ). xnn is the number of the message that prompted the response.	a. Type IGNORE to continue processing. b. Type CANCEL or Ⓑ to cancel.	None

Note: The types of messages issued by logical IOCS can be grouped as follows:
41xx = Tape file
42xx = Indexed sequential files
43xx = Sequential input disk OPEN
44xx = Sequential output disk OPEN
45xx = Sequential disk CLOSE
46xx = Direct access files
47xx
48xx = Common OPEN/CLOSE routines
49xx = Sequential disk work files
4Bxx = BTAM

4110A	tape label in error NO VOL1 LBL FOUND filename SYSxxx	Standard labeled output specified, but no volume label found.	a. Type CANCEL or Ⓑ to cancel. b. Mount new tape and type NEWTAP to continue processing.	Job canceled.
4111A	tape label in error NO VOL1 LBL FOUND filename SYSxxx	Standard labeled input specified, but no volume label found.	a. Type CANCEL or Ⓑ to cancel. b. Type IGNORE to continue processing.	Job canceled.
4112A	tape label in error VOL SERIAL NO. ERROR filename SYSxxx	The volume serial number on the tape does not agree with the serial number in the TPLAB statement.	a. Type CANCEL or Ⓑ to cancel. b. Mount new tape and type NEWTAP to continue processing. c. Type IGNORE to continue processing with mounted reel.	Job canceled.
4113D	tape label in error NO HDR1 LBL FOUND filename SYSxxx	Standard labeled input specified, but no standard header label can be found.	a. Type CANCEL or Ⓑ to cancel. b. Type IGNORE to continue processing.	Job canceled.
4114A	tape label in error FILE SEQ NO. ERROR filename SYSxxx	Standard labeled input file. Multifile set is positioned beyond desired file.	a. Type CANCEL or Ⓑ to cancel. b. Remount or reposition the file and type RETRY to continue processing.	Job canceled.
4115A	tape label in error SERIAL NO. ERROR filename SYSxxx	Wrong file or file set has been mounted. The tape header label serial number does not agree with the serial number in the TPLAB statement.	a. Type CANCEL or Ⓑ to cancel. b. Mount correct reel and type NEWTAP to continue processing.	Job canceled.
4116A	tape label in error VOLUME SEQ NO.ERROR ERROR filename SYSxxx	The wrong volume of the set has been mounted. The volume sequence number in the header label does not agree with the TPLAB statement information.	a. Type CANCEL or Ⓑ to cancel. b. Mount correct reel and type NEWTAP to continue processing.	Job canceled.
4117D	tape label in error NO TAPE MARK FOUND ON READBACK filename SYSxxx	Read backward specified and no tape mark found as the first record. IOCS cannot position file correctly.	a. Type CANCEL or Ⓑ to cancel. b. Type IGNORE to continue processing	Job canceled.
4118D	tape label in error ERROR FOUND IN TRAILER LBL filename SYSxxx	Read backward specified and error found in checking trailer label. Label does not agree with information in the TPLAB statement.	a. Type CANCEL or Ⓑ to cancel. b. Type IGNORE to continue processing.	Job canceled.

119A	tape label in error FILE UNEXPIRED filename SYSxxx	Expiration date on mounted scratch tape has not been reached; tape is still active.	a. Type CANCEL or Ⓑ to cancel. b. Mount new tape and type NEWTAP to continue processing. c. Type IGNORE to continue processing with mounted reel.	Job canceled.
120I	tape label in error TAPE POSITIONED WRONG filename SYSxxx	Standard labeled output specified, no rewind specified, and tape is not at load point. No prior standard label set found for use in creating the required label set.	Job canceled.	Job canceled.
121A	NO ALTERNATE DRIVE ASSIGNED filename SYSxxx	No alternate drive assigned to SYSPCH, SYSLST, or SYSLNK output tape.	Mount a new tape and type NEWTAP to continue processing.	Job canceled.
122I	EOV ON SYSxxx	End of volume was reached while writing on SYSLST, SYSPCH, or SYSLNK assigned to an output tape.	Processing continues.	Job canceled.
130A	EOF OR EOV INQUIRY filename SYSxxx	Input file and a tape mark has been sensed. Non-standard or standard labels are specified. Cannot be determined whether EOF or EOV exists.	a. Type CANCEL or Ⓑ to cancel. b. Type EOF if end of file exists. c. Type EOV if end of volume exists.	Job canceled.
131D	tape label in error BLOCK COUNT ERROR filename SYSxxx	Discrepancy detected in checking block count on input file.	a. Type CANCEL or Ⓑ to cancel. b. Type IGNORE to continue processing.	Job canceled.
133D	tape label in error ERROR IN HDR LBL filename SYSxxx	An error has been detected in some field of the header label other than: serial, file sequence, or volume serial numbers.	Type CANCEL or Ⓑ to cancel or Mount a new tape and type NEWTAP to continue processing or Type IGNORE to continue processing with same reel.	Job canceled.
140A	NO ALTERNATE DRIVE filename SYSxxx	End of volume has been reached on input or output file and no alternate drive is specified.	Type CANCEL or Ⓑ to cancel job. or Mount new reel on specified drive and type NEWTAP to continue processing.	Job canceled.
150I	RETRY	CRDERR=RETRY was specified in the DTF parameter and indicates that a retry was made to the punch errors on the device experiencing an equipment check. The message follows 0P10A EQUIP CHECK.	Processing continues.	Job canceled.

4200I	NO LABEL SPACE IN VTOC filename SYSxxx	The volume table of contents is full.	Job canceled.	Job canceled.
4201I	NO FORMAT 1 LABEL FOUND filename SYSxxx	The Format 1 label for this file was not found while searching key.	Job canceled.	Job canceled.
	NO RECORD FOUND filename SYSxxx	A no-record-found condition occurred while searching for a Format 1 label.	Job canceled.	Job canceled.
4202I	NO RECORD FOUND filename SYSxxx	A no-record-found condition occurred while searching for a Format 2 label.	Job canceled.	Job canceled.
4204I	NO FORMAT 4 LBL IN VTOC filename SYSxxx	The VTOC pointer address in the volume label did not point to a Format 4 label.	Job canceled.	Job canceled.
	NO RECORD FOUND filename SYSxxx	A no-record-found condition occurred while searching for a Format 4 label.	Job canceled.	Job canceled.
4206I	NO STANDARD VOL1 LABEL filename SYSxxx	The record on cylinder 0, track 0, record 3 is not a VOL1 label.	Job canceled.	Job canceled.
	NO RECORD FOUND filename SYSxxx	A no-record-found condition occurred while searching for a VOL1 label.	Job canceled.	Job canceled.
4209I	NO RECORD FOUND filename SYSxxx	A no-record-found condition occurred while searching the VTOC for file labels.	Job canceled.	Job canceled.
4230D	FMT1-DLAB UNEQUAL filename SYSxxx	The DLAB data portion does not compare equal with the Format 1 label data for the input file.	Type IGNORE to allow extents to be passed to user without further processing or checking, or Type CANCEL or Ⓑ to cancel.	Job canceled.
4233A	EQUAL FILE ID IN VTOC	The xx byte filename is being used to create more than one Format 1 label in the VTOC spanning two or more jobs or A job may be run again after being previously canceled.	Same as for message 4433A	Job canceled.
4240I	XTENT OVERLAP ON ANOTHER filename SYSxxx	One XTENT card limit overlaps another XTENT card limit.	Job canceled.	Job canceled.
4241I	XTENT OVERLAPS ON VTOC filename SYSxxx	An XTENT card limit overlaps the VTOC limits.	Job canceled.	Job canceled.

)te: Message numbers 42nn through 49nn, pertaining to Disk OPEN and CLOSE messages, that require a response can accept either CANCEL or CANCELV. A display option is also possible for these messages by typing the response DSPLYV.

CANCELV -- Instead of typing CANCEL to terminate the job, the operator can type CANCELV to get a VTOC dump on SYSLST, provided that the DUMP option was specified for the job and SYSLST is assigned to a printer. (See Appendix G for sample SYSLST output.)

DSPLYV -- The operator can display the VTOC by typing in DSPLYV, provided the proper assignments have been made. This option does not terminate the job, but reissues the same message prior to the VTOC display request. (See Appendix G for sample SYSLST output.)

IO.	MESSAGE	CAUSE	ACTION	DEFAULT
44A	OVERLAP ON UNEXPIRED FILE filename SYSxxx	The XTENT card limits overlap the extent limits of a file label whose expiration date had not occurred.	See Note before message 4244A or Type DELETE to delete the overlapped file label only if this action is requested by the user. Otherwise, type CANCEL or CANCELV to terminate job. Under normal operating procedure, the SYSRES label file should never be deleted.	Job canceled.
46D	INVALID DLAB SERIAL NO.	The serial number in the DLAB card does not match the serial number on first XTENT card.	See Note before message 4244A, or Type IGNORE to continue processing.	Job canceled.
45I	TOO MANY XTENTS filename SYSxxx	More than three extents are specified for an indexed sequential file.	Job canceled.	Job canceled.
47I	DISCONT INDEX XTENTS filename SYSxxx	The master and cylinder index limits are not continuous.	Job canceled.	Job canceled.
52I	DISCONT TYPE 1 XTENTS filename SYSxxx	The prime data extents for a multipack file do not start on cylinder 1, track 0 or end of cylinder 199 track 9 (subcell 19, strip 5, cylinder 4, track 19 for 2321).	Job canceled.	Job canceled.
54I	DSK XTN ENTRY TABLE FULL filename SYSxxx	The disk extent table in the DTF has no more room for entries.	Job canceled.	Job canceled.
55A	WRONG PACK, MOUNT nnnnnn filename SYSxxx	Wrong pack is mounted; nnnnnn is the pack serial number of the correct pack.	See Note before message 4244A or Type NEWPAC if correct pack is now mounted.	Job canceled.

4259I	DATA TRACK LIMIT INVALID filename SYSxxx	The indexed sequential prime data area lower limit does not start on track 0, or the upper limit does not end on track 9 for a 2311 or track 19 for a 2321.	Job canceled.	Job canceled.
4261I	INVALID DLAB FUNCTION	An ISC was specified for a non-load function in DLAB card.	Job canceled.	Job canceled.
4262I	NO PRIME DATA XTENT	No type one XTENT for an ISFMS file	Job canceled.	Job canceled.
4263I	LOAD FILE NOT CLOSED	Programmer did not close load file.	Job canceled.	Job canceled.
4301D	NO FORMAT 1 LABEL FOUND filename SYSxxx	No format 1 label was found in the VTOC on a search key equal.	See Note before message 4244A or Type IGNORE to allow extents to be passed to the user without further processing or checking. Any other response causes INVALID RESPONSE message.	Job canceled.
4301I	NO RECORD FOUND filename SYSxxx	A no-record-found condition occurred on a Search ID equal when retrieving a Format 1 label.	Job canceled.	Job canceled.
4303D	NO FORMAT 3 LABEL FOUND filename SYSxxx	A no-record-found condition occurred while searching for a Format 3 label.	See Note before message 4244A or Type IGNORE to allow the extents to be passed to the user without further processing or checking. Any other response causes an INVALID RESPONSE message.	Job canceled.
4304I	NO FORMAT 4 LBL IN VTOC filename SYSxxx	The VTOC pointer address in the volume label did not point to a Format 4 label.	Job canceled.	Job Canceled.
	NO RECORD FOUND filename SYSxxx	A no-record-found condition occurred while searching for a Format 4 label.	Job canceled.	Job canceled.
4306I	NO STANDARD VOL 1 LABEL filename SYSxxx	Information at cylinder 0 track 0, record 3 is not a standard volume label.	Job canceled.	Job canceled.
	NO RECORD FOUND filename SYSxxx	A no-record-found condition occurred while searching for a volume label.	Job canceled.	Job canceled.

307I	NO RECORD FOUND filename SYSxxx	End of label area reached while attempting to read an extent record.	Job canceled.	Job canceled.
308D	NO RECORD FOUND filename SYSxxx	A no-record-found condition occurred while searching for a user header label or a user trailer label.	See Note before message 4244A or Type IGNORE to bypass the remaining user label and continue job. Any other response causes an INVALID RESPONSE message.	Job canceled.
330D	FMT1-DLAB UNEQUAL filename SYSxxx	The file serial number, creation date, or expiration date are not the same in the Format 1 file label and the DLAB information.	See Note before message 4244A or Type IGNORE to bypass the remaining user label and continue job. Any other response causes an INVALID RESPONSE message.	Job canceled.
331D	VOL SEQUENCE ERROR filename SYSxxx	Volume Sequence Number on current pack is not equal to the Volume Sequence Number in the DLAB information, or Packs are not being processed sequentially.	See Note before message 4244A or Type IGNORE to ignore the error and continue processing. Any other response causes an INVALID RESPONSE message.	Job canceled.
338D	USER HDR LBL IS NOT STD. filename SYSxxx	The first three characters of the user's header label do not contain 'UHL'	See Note before message 4244A or Type IGNORE to continue processing this label. Any other response causes an INVALID RESPONSE message.	Job canceled.
339D	USER TRL LBL IS NOT STD. filename SYSxxx	The first three characters of the user's trailer label do not contain 'UTL'	See Note before message 4244A or Type IGNORE to continue processing this label. Any other response causes an INVALID RESPONSE message.	Job canceled.
342A	NO MATCHING XTENT filename SYSxxx	The extents within the labels for the file could not be matched with the incoming extent.	See Note before message 4244A or Type BYPASS to bypass the present extent and continue processing. Any other response causes an INVALID RESPONSE message.	Job canceled.

4343D	NO MORE EXTENTS AND NO EOF filename SYSxxx	An OPEN was issued by logic module for another extent that has been depleted by previous open commands, or Only 1 extent was entered and the logic module didn't get to the end of the user's file. Note: The user should be aware that the last record may not be processed with certain types of SDMOD's (GET). This applies to both GET with and without UPDATE.	See Note before message 4244A or Type IGNORE to continue processing. Any other response causes an INVALID RESPONSE message.	Job canceled.
4355A	WRONG PACK, MOUNT nnnnnn filename SYSxxx	The wrong pack is mounted (nnnnnn is the volume serial number).	Mount the correct pack and type NEWPAC to continue processing, or See Note before message 4244A.	Job canceled.
4360I	NO XTENTS, ALL BYPASSED filename SYSxxx	No extents were opened because they were eliminated through previous BYPASS options.	Job canceled.	Job canceled.
4366A	1 TRACK USER LBL XTENT filename SYSxxx	More than one track must be specified on the first extent with the user label option.	See Note before message 4244A or Type BYPASS to bypass the extent in error and continue processing. Any other response causes an INVALID RESPONSE message.	Job canceled.
4400I	NO LABEL SPACE IN VTOC filename SYSxxx	There is no space left in the VTOC for a new output file label.	Job canceled.	Job canceled.
4401I	NO RECORD FOUND filename SYSxxx	A no-record-found condition occurred while searching for a Format 1 label.	Job canceled.	Job canceled.
	NO FORMAT 1 LABEL FOUND filename SYSxxx	No Format 1 label was found in the VTOC for an IBM-supplied program.	Job canceled.	Job canceled.
4403I	NO RECORD FOUND filename SYSxxx	A no-record-found condition occurred while searching for a Format 3 label.	Job canceled.	Job canceled.
4404I	NO FORMAT 4 LBL IN VTOC filename SYSxxx	The VTOC pointer address in the volume label did not point to Format 4 label.	Job canceled.	Job canceled.
	NO RECORD FOUND filename SYSxxx	A no-record-found condition occurred while searching for a Format 4 label.	Job canceled.	Job canceled.

406I	NO STANDARD VOL1 LABEL filename SYSxxx	Information at cylinder 0, track 0, record 3 is not a standard volume label.	Job canceled.	Job canceled.
	NO RECORD FOUND filename SYSxxx	A no-record-found condition occurred while searching for the volume label.	Job canceled.	Job canceled.
407I	NO RECORD FOUND filename SYSxxx	End of label area reached while attempting to read an extent record.	Job canceled.	Job canceled.
408D	NO UTL0 FILE MARK FOUND filename SYSxxx	A no-record-found condition occurred while searching key for UTL0 file mark to obtain an address for writing first trailer label.	See Note before message 4244A or Type IGNORE to the remaining user label and continue job. Any other response causes an INVALID RESPONSE message.	Job canceled.
409I	NO RECORD FOUND filename SYSxxx	A no-record-found condition occurred while searching VTOC for file labels.	Job canceled.	Job canceled.
433A	EQUAL FILE ID IN VTOC filename SYSxxx	The 44-byte filename is being used to create more than one Format 1 label in the VTOC spanning two or more jobs, or A job may be run again after being previously canceled.	See Note before message 4244A or Type DELETE to delete unexpired file with the identical 44-byte filename. Any other response causes an INVALID RESPONSE message.	Job canceled.
439I	CURRENT FILE LBL DELETED filename SYSxxx	An extent previously overlapped the file limits and a response was given to delete the file.	Job canceled.	Job canceled.
440A	XTENT OVERLAP ON ANOTHER filename SYSxxx	Overlapping extents have been specified for the file.	See Note before message 4244A or Type BYPASS to bypass XTENT that overlaps the previous opened XTENTS(S). Any other response causes an INVALID RESPONSE message.	Job canceled.
441A	XTENT OVERLAPS ON VTOC filename SYSxxx	An XTENT card limit overlaps the VTOC limit.	See Note before message 4244A or Type BYPASS to bypass the extent in error and continue processing. Any other response causes an INVALID RESPONSE message.	Job canceled.

4444A	(44-byte Format 1 identifier key) OVERLAP ON UNEXPIRED FILE filename SYSxxx	An XTENT card limit overlaps a limit on an unexpired file.	See Note before message 4244A or Type BYPASS to bypass the extent in error and continue processing, or Type DELETE to delete unexpired file from the VTOC only if this action is requested by the user. Otherwise type CANCEL or CANCELV to cancel the job. Under normal operating procedure, the SYSRES label file should never be deleted.	Job canceled.
4445I	TOO MANY XTENTS filename SYSxxx	More than one XTENT entered for an IBM-supplied program.	Job canceled.	Job canceled.
4446D	INVALID DLAB SERIAL NO. filename SYSxxx	Volume serial number on the first extent is not equal to the file serial number on the DLAB card.	See Note before message 4244A or Type IGNORE to ignore the error. OPEN will replace the incorrect file serial number on the DLAB card with that from the XTENT card and continue processing. Any other response causes an INVALID RESPONSE message.	Job canceled.
4450A	NO MORE AVAILABLE XTENTS filename SYSxxx	There were no more extents available when an OPEN output was issued.	See Note before message 4244A or Type a new extent in the following form: 001,,bccccchhh, bccccchhh Ⓑ or 128,, bccccchhh,bccccchhh Ⓑ The first ccccchhh is the lower limit; the second ccccchhh is the upper limit. The OPEN will supply the extent sequence number (the next sequence number after the last extent.) The b in the extent limit is ignored; it is replaced by the b from the last extent opened.	Job canceled.
4455A	WRONG PACK, MOUNT nnnnnn filename SYSxxx	The wrong pack is mounted. (nnnnnn is the volume serial number).	Mount the correct pack and type NEWPAC to continue job or See Note before message 4244A.	Job canceled.

460I	NO XTENTS, ALL BYPASSED filename SYSxxx	No extents were opened because all were bypassed by BYPASS option.	Job automatically canceled.	Job canceled.
466A	1TRACK USER LBL XTENT filename SYSxxx	Insufficient tracks are specified on the first XTENT with user label option.	See Note before message 4244A or Type BYPASS to bypass the XTENT in error and continue processing.	Job canceled.
477A	XTENT ENTRY ERROR RETRY filename SYSxxx	An error was detected in one or more of the extents fields.	See Note before message 4244A or Type a new extent in the following form: 001,,bccccchhh, bccccchhh Ⓑ or 128,,bccccchhh, bccccchhh Ⓑ . The 1st cccchhh is the lower limit; the second cccchhh is the upper limit. The OPEN will supply the extent sequence number (the next sequence number after the last extent). The b in the extent limit ignored; it is replaced by the b from the last extent opened.	Job canceled.
501I	NO FORMAT 1 LABEL FOUND filename SYSxxx	No Format 1 label was found in the VTOC.	Job canceled.	Job canceled.
	NO RECORD FOUND filename SYSxxx	A no-record-found condition occurred while searching for a Format 1 label.	Job canceled.	Job canceled.
503I	NO RECORD FOUND filename SYSxxx	A no-record-found condition occurred while searching for a Format 3 label.	Job canceled.	Job canceled.
506I	NO RECORD FOUND filename SYSxxx	A no-record-found condition occurred while searching for a volume label.	Job canceled.	Job canceled.
	NO STANDARD VOL1 LABEL filename SYSxxx	Information at cylinder 0, track 0, record 3 is not a standard volume label.	Job canceled.	Job canceled.
501I	NO FORMAT 1 LABEL FOUND filename SYSxxx	No format 1 label found for an input file or for a user input routine.	Job canceled	Job canceled.
503I	NO RECORD FOUND filename SYSxxx	A no-record-found condition occurred while searching for a Format 3 label.	Job canceled.	Job canceled.
506I	NO STANDARD VOL 1 LABEL filename SYSxxx	No standard volume label found on the pack for an input file.	Job canceled.	Job canceled.

4630D	FMT 1 - DLAB UNEQUAL filename SYSxxx	Format 1 data and DLAB card information do not agree (ID, serial number, creation date, expiration date).	Type CANCEL or Ⓑ to cancel, or Type IGNORE to continue the job.	Job canceled.
4651I	SYSUNITS NOT IN SEQUENCE filename SYSxxx	Programmer symbolic units are not assigned in sequence. This can occur if all extents for a symbolic unit were deleted.	Job canceled.	Job canceled.
4655A	WRONG PACK, MOUNT nnnnnn filename SYSxxx	Serial number on pack does not agree with number on first extent. nnnnnn is the volume serial number of the pack to be mounted.	See Note before message 4244A or Mount pack with given serial number and type NEWPAC to continue processing.	Job canceled.
4660I	NO XTENTS, ALL BYPASSED filename SYSxxx	All extents for this file have been bypassed.	Job canceled.	Job canceled.
4700I	NO LABEL SPACE IN VTOC filename SYSxxx	No space available in the VTOC to write a new label for an output file.	Job canceled.	Job canceled.
4701I	NO FORMAT 1 LABEL FOUND filename SYSxxx	No Format 1 label found for an output file or for user output routine.	Job canceled.	Job canceled.
	NO RECORD FOUND filename SYSxxx	A no-record-found condition occurred while searching for a Format 1 label.	Job canceled.	Job canceled.
4704I	NO FORMAT 4 LABEL IN VTOC filename SYSxxx	No standard Format 4 label found in the VTOC.	Job canceled.	Job canceled.
4706I	NO STANDARD VOL1 LABEL filename SYSxxx	No standard volume label found on the pack for an output file.	Job canceled.	Job canceled.
4709I	NO RECORD FOUND filename SYSxxx	A no-record-found condition occurred when searching the VTOC.	Job canceled.	Job canceled.
4733A	EQUAL FILE ID IN VTOC filename SYSxxx	The 44-byte filename is being used to create more than one Format 1 label in the VTOC spanning two or more jobs, or A job may be running again after being previously canceled.	See Note before message 4244A, or Type DELETE to delete unexpired file with the identical 44-byte filename. Any other response causes an INVALID RESPONSE message.	Job canceled.

740A	XTENT OVERLAP ON ANOTHER filename SYSxxx	Overlapping extents have been specified.	See Note before message 4244A, or Type BYPASS to delete the extent and continue processing.	Job canceled.
741A	XTENT OVERLAP ON VTOC filename SYSxxx	A specified extent overlaps on the VTOC.	See Note before message 4244A, or Type BYPASS to delete the extent and continue processing.	Job canceled.
744A	(44-byte key) OVERLAP ON UNEXPIRED FILE filename SYSxxx	An extent overlaps the unexpired file defined by the 44-byte key.	See Note before message 4244A, or Type BYPASS to delete the extent and continue processing, or Type DELETE to delete the file only if this action is recommended by the user. Otherwise type CANCEL or CANCELV to cancel job. Under normal operating procedures, the SYSRES label file should never be deleted.	Job canceled.
745I	TOO MANY EXTENTS filename SYSxxx	More than 15 extents on a volume with user labels, or More than 16 extents on a volume without user labels.	Job canceled.	Job canceled.
746D	INVALID DLAB SERIAL NUMBER filename SYSxxx	Serial number in disk label does not check with that in first extent.	See Note before message 4244A or Type IGNORE if the serial number on the extent is assumed.	Job canceled.
748A	XTENT TYPE NOT 1 filename SYSxxx	Extent specified on control card was not type 1.	See Note before message 4244A or Type 001 to make the type a 1 and continue processing, or Type BYPASS to bypass the extent and continue processing.	Job canceled.
751I	SYSUNITS NOT IN SEQUENCE filename SYSxxx	Programmer symbolic units on the XTENT card must be in ascending sequence.	Job canceled.	Job canceled.

4755A	WRONG PACK, MOUNT nnnnnn filename SYSxxx	Serial number on pack does not agree with number on first XTENT. nnnnnn is the volume serial number of the pack to be mounted.	See Note before message 4244A or Mount pack with given serial number, and type NEWPAC to continue processing.	Job canceled.
4760I	NO XTENTS, ALL BYPASSED filename SYSxxx	All extents for the file have been eliminated by previous BYPASS responses.	Job canceled.	Job canceled.
4766A	1 TRACK XTENT/USER LABELS filename SYSxxx	The first XTENT does not have two tracks and user labels are specified.	See Note before message 4244A or Type BYPASS to bypass the present XTENT.	Job canceled.
4807I	NO REC FND filename SYSxxx	A no-record-found condition occurred while searching for a DLAB/XTENT record on SYSRES. Previous record indicated that the following record should be present.	Job canceled.	Job canceled.
4859A	INVALID XTENT filename SYSxxx	Extent does not fall within the valid limits for 2311 or 2321.	See Note before message 4244A or Type BYPASS to ignore the extent and continue processing.	Job canceled.
4859I	INVALID XTENT filename SYSxxx	Extent does not fall within the valid limits for an indexed sequential 2311 or 2321 file.	Job canceled.	Job canceled.
4861I	INVALID DLAB FUNCTION	DLAB function does not match DTF type for file (for example DA DLAB for indexed sequential file).	Job canceled.	Job canceled.
4880I	WRONG FILE TYPE	DTF table for this file has an invalid type code.	Job canceled.	Job canceled.
4881I	NO LABEL INFORMATION filename SYSxxx	The label for this file cannot be found in SYSRES label storage area for this job type (i.e., background, foreground 2, foreground 1).	Job canceled.	Job canceled.
4883I	INVALID LOGICAL UNIT filename SYSxxx	A logical unit is assigned to an unsupported or unassigned device.	Job canceled.	Job canceled.
4884D	FILE PROTECT RING NEEDED	An output file requires a file protect ring to write.	See Note before message 4244A or Place file protect ring in reel and type IGNORE to continue processing.	Job canceled.

885I	SYSxxx AND SYSyyy ARE ASSIGNED TO THE SAME PHYSICAL UNIT filename SYSxxx	Incorrect assignments.	Job canceled.	Job canceled.
887I	SYS FILE XTENT EXCEEDED	XTENT exceeded on system output file.	Job canceled.	Job canceled.
890I	NO JIBS AVAILABLE	Self-explanatory.	Job canceled.	Job canceled.
900I	NO RECORD FOUND filename SYSxxx	A no record found condition was detected while searching for new label space.	Job canceled.	Job canceled.
	NO LABEL SPACE IN VTOC filename SYSxxx	No available space in VTOC for a new output file label.	Job automatically canceled.	Job canceled.
901I	NO RECORD FOUND filename SYSxxx	A no record found condition occurred while searching for a Format 1 label.	Job canceled.	Job canceled.
903I	NO RECORD FOUND filename SYSxxx	A no record found condition occurred while searching for a Format 3 label.	Job canceled.	Job canceled.
904I	NO FORMAT 4 LBL IN VTOC filename SYSxxx	The VTOC pointer address in volume label does not point to a Format 4 label.	Job canceled.	Job canceled.
	NO RECORD FOUND filename SYSxxx	NO-RECORD-FOUND CONDITION occurred while searching for a Format 4 label.	Job canceled.	Job canceled.
906I	NO STANDARD VOL1 LABEL filename SYSxxx	The information at cylinder 0, track 0, record 3 is not a standard volume label.	Job canceled.	Job canceled.
	NO RECORD FOUND filename SYSxxx	A no-record-found condition occurred when searching ID for a volume label.	Job canceled.	Job canceled.
907I	NO RECORD FOUND filename SYSxxx	End of label area reached while attempting to read XTENT card.	Job canceled.	Job canceled.
909I	NO RECORD FOUND filename SYSxxx	A no-record-found condition occurred when searching ID for labels in the VTOC.	Job canceled.	Job canceled.
933A	EQUAL FILE ID IN VTOC filename SYSxxx	The 44-byte filename is being used to create more than one Format 1 label in the VTOC spanning two or more jobs, or A job may be run again after being previously canceled.	See Note before message 4244A or Type DELETE to delete unexpired file with the identical 44-byte filename. Any other response causes an INVALID RESPONSE message.	Job canceled.
939I	DELETED WORKFILE LABEL filename SYSxxx	An extent for another previously opened file overlaps the work file limits and a response was given to delete the work file.	Job canceled.	Job canceled.

4940A	XTENT OVERLAP ON ANOTHER filename SYSxxx	Overlapping extents have been specified for the file.	See Note before message 4244A or Type BYPASS to bypass the XTENT that overlaps the previous opened XTENT(S). Any other response causes an INVALID RESPONSE message.	Job canceled.
4941A	XTENT OVERLAPS ON VTOC filename SYSxxx	An XTENT card overlaps the VTOC limits.	See Note before message 4244A or Type BYPASS to bypass the extent in error and continue processing. Any other response causes an INVALID RESPONSE message.	Job canceled.
4942I	NO MORE AVAIL/MATCH XTENT filename SYSxxx	All the extents have been exhausted through consecutive OPEN's or An extent cannot be found matching those extents from a previous POINT macro.	Job canceled.	Job canceled.
4944A	(44-byte Format 1 identifier key field) OVERLAP ON UNEXPIRED FILE filename SYSxxx	An XTENT card limit overlaps a limit on an unexpired file.	See Note before message 4244A, or Type BYPASS to bypass the extent in error and continue processing, or Type DELETE to delete the unexpired file from the VTOC only if this action is requested by the user. Otherwise, type CANCEL or CANCELV to cancel the job. Under normal operating procedure, the SYSRES label file should never be deleted.	Job canceled.
4946D	INVALID DLAB SERIAL NO. filename SYSxxx	The volume serial number on the first XTENT is not equal to the file serial number on the DLAB card.	See Note before message 4244A, or Type IGNORE to ignore the error. OPEN will replace the incorrect file serial number on the DLAB card with that from the XTENT card and continue processing. Any other response causes an INVALID RESPONSE message.	Job canceled.

947A	XTENTS NOT ON SAME UNIT filename SYSxxx	All the extents for a unit must be on the same disk pack.	See Note before message 4244A, or Type BYPASS to bypass the extent in error and continue processing. Any other response causes an INVALID RESPONSE message.	Job canceled.
955A	WRONG PACK,MOUNT nnnnnn filename SYSxxx	The wrong pack is mounted. (nnnnnn is the volume serial number).	Mount the correct pack and type NEWPAC, or See Note before message 4244A.	Job canceled.
960I	NO XTENTS, ALL BYPASSED filename SYSxxx	No extents were opened or the extents were eliminated by previous BYPASS responses.	Job canceled.	Job canceled.

For the following BTAM error messages, the action taken by the system is determined by the CANCEL operand in the BTMOD macro instruction.

If CANCEL=YES the current operation is discontinued and the job is canceled.

If CANCEL=NO the current operation is discontinued and control is returned to the user's program at the next sequential instruction.

D.	MESSAGE	CAUSE
300I	USER REFERRED TO CLOSED DTFBT DTFBT=nnnnnn DECB=nnnnnn	DTFBT was not opened.
301I	DTFBT FIELD IMPROPERLY INITIALIZED DTFBT=nnnnnn DECB=nnnnnn	Error in the DTFBT.
302I	DECB FIELD IMPROPERLY INITIALIZED DTFBT=nnnnnn DECB=nnnnnn	Error in the DECB.
303I	MULTIPLE WAIT COUNT NEGATIVE DTFBT=nnnnnn DECB=nnnnnn	User specified negative WAIT count.
304I	MULTIPLE WAIT COUNT EXCEEDS ECBLIST SIZE DTFBT=nnnnnn DECB=nnnnnn	More events than ECB's specified.
305I	ATTEMPT TO PROCESS NON-BTAM BUFFER DTFBT=nnnnnn DECB=nnnnnn	User referred to non-BTAM buffer.
306I	UNEXPECTED PROGRAM ERROR IN RELBUF DTFBT=nnnnnn DECB=nnnnnn	Buffer cannot be returned to pool.
307I	REQBUF COUNT NEGATIVE DTFBT=nnnnnn DECB=nnnnnn	User requested negative number of buffers.
308I	RESETPL DECB AND LCB DECB NOT SAME DTFBT=nnnnnn DECB=nnnnnn	User referred to wrong DECB for line.

4B09I	P TIME OUT ON 2848 RESPONSE DTFBT=nnnnnn DECB=nnnnnn	1. Program issued wrong selection character or possible problem between CPU, 2248, and 2260. Control is returned to the user's program. Call operator of the 2848 (identified by UNIT address in message) and tell him to reset 2848 by turning the power off and then on.
4B19I	P NO CCB ENQ YSSnnccuu DECB=nnnnnn TI=nnnn DC=nnnnnnnn	No CCB on queue. (Job is automatically canceled.)
4B20I	P ERR IN ERP	Error occurred in error recovery procedure.
4B21I	P CHAN DATCK	Channel data check.
4B22I	P SHOULD NOT	Condition other than those defined in this list. This error is not recoverable.
4B23I	P CHAIN CHK	Chaining check.
4B24I	P PROGRAM CK	Programming error detected by channel.
4B25I	P PROTECT CK	A user read command attempted to read into a main storage area outside the problem area.
4B26I	P UNIT EXCEPTION	Unit exception
4B27I	P EQUIP CK	Unit check (equipment check).
4B28I	P LOST DATA	Unit check (lost data).
4B29I	P TIME OUT	The communications line has been idle for the time-out period specified by the transmission control unit or terminal control unit and the active command is Read.
4B30I	P INTERV REQ	Intervention required on unit check. Device not ready.
4B31I	P BUS OUT CK	Unit check (parity error).
4B32I	P DATA CK	Unit check (data check).
4B33I	P OVERRUN	Data lost because data service could not be obtained within the byte interval of the addressed unit.
4B34I	P COMMAND RJ	The command cannot be executed because it is not defined for the unit.
4B40I	LINE ERROR THRESHOLD REACHED SYSnnn=nnn	The error count has reached its specified limit.
4B60I	LINE DELAY	Time needed to enable the line.
4B98I	TR=xxx/yyy,DC=xxx/yyy,IR=xxx/yyy, TO=xxx/yyy	This message is always preceded by 4B40I. The error count has reached specified limit.
4B99I	CSW17=nnnnnnnnnnnnnn CCW=nnnnnnnnnnnnnnnn	This message is always preceded by 4B19I. No CCB on queue.

NO.	MESSAGE	CAUSE	ACTION	DEFAULT
V04I	NO RECORD FOUND filename SYSxxx	A no record found condition occurred while searching for a Format 4 label.	Job canceled.	Job canceled.
V04I	NO FORMAT 4 LBL IN VTOC filename SYSxxx	The VTOC pointer address in the volume label does not point to a Format 4 label.	Job canceled.	Job canceled.
V06I	NO RECORD FOUND filename SYSxxx	A no record found condition occurred while searching for the volume label.	Job canceled.	Job canceled.
V06I	NO STANDARD VOL LABEL filename SYSxxx	The information at cylinder 0, track 0, record 3 is not a standard volume label.	Job canceled.	Job canceled.
V09I	NO RECORD FOUND filename SYSxxx	A no record found condition occurred while searching for the VTOC for file labels.	Job canceled.	Job canceled.
V95A	SYSLOG OR SYSLST	The response DSPLYV was entered for a VTOC display to a disk open message.	Type CANCEL or Ⓑ to cancel the job. or SYSLOG Ⓑ to have the VTOC displayed on the printer-keyboard, SYSLST Ⓑ to have the VTOC displayed on the printer. Any other response causes an INVALID RESPONSE message.	Job canceled.
V96A	SYSLST NOT A PRINTER	The response DSPLYV was entered for a VTOC to be displayed on the printer and SYSLST is not assigned to a printer.	Type CANCEL or Ⓑ to cancel the job, or SYSLOG Ⓑ to have the VTOC displayed on the printer-keyboard. Any other response causes an INVALID RESPONSE message.	Job canceled.

NO.	MESSAGE	CAUSE	ACTION	DFLT
7D01I	COLUMN 1 NOT BLANK. CONTROL CARD NUMBER xx.	Column 1 of a sort/merge control card is not blank. xx represents the number of the control statement within the sequence of sort/merge control statements.	Correct the control statement(s) in error. See message 7D90A.	None
7D021	L3 INVALID FOR ADDROUT OPTION	The output record length (L3) must: 1. equal 10 when ADDROUT=A or 2. be at least 11 if ADDROUT=D or 3. be no greater than 10 bytes plus the length of all control fields if ADDROUT=D and Exit 32 is not specified.	Correct the L3 values in the RECORD statement, or Correct the ADDROUT entry in the OPTION statement. Also see message 7D90A.	None
7D03I	STATEMENT DEFINER INVALID - xxxxxx	The statement definer is invalid or does not appear between columns 2 and 15 in the control statement.	Correct the control statement definer indicated. See message 7D90A.	None
7D04I	NO END CARD FOUND AFTER READING 25 CONTROL CARDS	More than 25 control statements have been read without encountering an END statement. The maximum number of control statements permitted is 25.	Delete all erroneous control cards or insert an END control statement after the sort/merge control statements. See message 7D90A.	None
7D05A	CONTINUATION CONTROL CARD xx DOES NOT START IN COLUMN 16.	A continuation card must begin in column 16. xx represents the number of the invalid control statement.	Correct the continuation control statement in error. See message 7D90A.	None
7D07I	MANDATORY xxxxxx CARD OMITTED	A mandatory control statement has been omitted. The statement definer of the missing card is identified by xxxxxx.	Include the missing control statement in the sort merge control statements. See message 7D90A.	None
7D08I	TYPE RUN NOT KNOWN - SORT OR MERGE NOT SPECIFIED	Neither a SORT nor a MERGE control statement was included.	Include the SORT or MERGE statement. See message 7D90A.	None
7D09I	NO BLANK AFTER STATEMENT DEFINER - xxxxxxx	A blank does not separate the statement definer from the first field definer. The first six x's relate to statement definer while the last x identifies the illegally punched character.	Correct the control statement indicated by leaving at least one blank between the statement and operand definers. See message 7D90A.	None
7D10I	FIELD DEFINER INVALID - xxxxxxxx	The field definer identified by xxxxxxxx was not recognized as a valid field definer.	Correct the invalid field or operand definer. See message 7D90A.	None

D11I	VALUES INVALID - xxxxxx	The value(s) following a field definer is invalid. xxxxxx identifies the invalid value(s).	Correct the control statement that contains the invalid value. See message 7D90A.	None
D12I	INVALID FORMAT CODE GIVEN - xx	The format code for the input data is punched incorrectly or is missing.	Correct the FORMAT value (code) in the SORT or MERGE control statement. See message 7D90A.	None
D13I	SORT AND MERGE CONTROL CARDS SPECIFIED IN SAME RUN	Both a SORT and a MERGE control statement were included. Only one is acceptable.	Delete the erroneous statement from the control statements. See message 7D90A.	Name
D14I	NO SEQUENCE VALUE GIVEN FOR CF xx.	No sequence (ascending or descending) has been specified in the SORT or MERGE control statement for one or more control data fields.	Specify a collating sequence for the indicated control data field in the SORT or MERGE control statement. See message 7D90A.	None
D15I	MORE THAN 12 CONTROL FIELDS SPECIFIED	The maximum number of control fields to be used in sorting or merging is 12.	Correct the control data fields in the SORT or MERGE control statement. See message 7D90A.	None
D16I	DATA FORMAT ENTRY NOT SPECIFIED	The FORMAT field definer was not specified in either a SORT or MERGE control statement.	Correct the SORT or MERGE control statement by including the FORMAT entry. See message 7D90A.	None
D17I	NO MAJOR CONTROL FIELD WAS GIVEN	Control field 1 specifications were not recognizable to the program because the FIELDS field definer was not included in a SORT or MERGE control statement.	Correct the SORT of MERGE control statement by including a FIELDS entry (with control field specifications). See message 7D90A.	None
D19I	FIXED BLOCKING SPECIFIED FOR VARIABLE LENGTH RECORDS	Variable-length records on input must be specified as being in variable-length blocks.	Correct the BLKSIZE fields definer complement in the INPFIL control statement. See message 7D90A.	None
D20I	CONTROL FIELD xx EXTENDS BEYOND END OF RECORD	A control data field identified by xx has been specified beyond the last valid byte of the logical record.	Correct the field definer complement of the FIELDS entry in the SORT or MERGE control statement. See message 7D90A.	None
D21I	TOTAL LENGTH OF CONTROL FIELDS EXCEEDS 256.	The maximum total length of all control data fields is 256 bytes.	Redefine the lengths of the control fields in the SORT or MERGE control statement. See message 7D90A.	None
D22I	CONTROL FIELD xx GREATER THAN MAXIMUM ALLOWED	The control data field identified by xx exceeds: 16 bytes for a decimal field; 4 or 8 bytes for a normalized floating-point number.	Correct the illegally defined length of control data field in the SORT or MERGE control statement. See message 7D90A.	None

7D23I	L4 MUST BE LESS THAN {L1 / L5}	During sort run for variable-length records, the minimum input record length must be less than the maximum or average input record length.	Correct either L4, L5, or L1 in the RECORD control statement. See message 7D90A.	None
7D24I	STORAGE SPECIFIED GREATER THAN ACTUAL MACHINE SIZE	The value specified in the STORAGE entry is greater than the machine size specified at IPL time.	Correct or omit the STORAGE value in the OPTION control statement. See message 7D90A.	None
7D25I	{L3 / L1} MORE THAN xxxx BYTES	The input or output record length exceeds the maximum length acceptable to the sort/merge program.	Correct the L1 or L3 entry in the RECORD control statement. See message 7D90A.	None
7D26I	KEYLEN ENTRY INVALID	The KEYLEN field definer can only be specified for fixed-length, unblocked records (disk input only).	Correct the OPTION control statement by deleting the KEYLEN entry.	None
7D28I	RECORD TYPE NOT SPECIFIED	The type field definer used to indicate fixed or variable length records has not been specified.	Correct the RECORD control statement by including the TYPE field definer and associated value. See message 7D90A.	None
7D29I	FILES ENTRY NOT SPECIFIED FOR MERGE	The number of files to be merged has not been specified. The FILES entry is mandatory for a merge only operation.	Correct the MERGE control statement by including the FILES entry. A maximum of four files can be merged.	None
7D30I	SIZE ENTRY OMITTED IN SORT STATEMENT	The SIZE field definer is a mandatory entry that is used to reflect an exact size or an estimate of the number of records to be sorted.	Include the SIZE field definer and associated value in the SORT control statement. See message 7D90A.	None
7D32I	USER PROGRAM ORIGIN GREATER THAN STORAGE SIZE	The main storage load point or origin address for a user program has been specified as being beyond the boundaries of the storage size. All user programs must be loaded below the storage size indicated either at IPL time or in the STORAGE entry.	Either correct the ADDRESS value in the MODS statement or change the STORAGE entry (if specified) in the OPTION statement. See message 7D90A.	None
7D33I	{L5 / L1} IS GREATER THAN	For a sort run for variable-length records, L5 has been specified greater than L1. L5 must be specified as either the average logical record length or as a value between the average and the maximum (L1).	Correct either the L5 value or the L1 value in the RECORD control statement. See message 7D90A.	None

)34I	{E32 / E43} NOT SPECIFIED WHEN L3 {MORE / LESS} THAN L1	If L3 > L1, either Exit 32 or Exit 43 must be included to lengthen records in phase 3 or 4. If L3 is less than L1 and variable-length records have been specified, Exit 32 or Exit 43 must be used to update the record length field of each truncated record.	Either correct the L1 or L3 value in the record statement, or include the appropriate exit (E32 or E43) in the MODS statement. See message 7D90A.	None
)35I	EXIT {31 / 44} NOT SPECIFIED FOR NONSTANDARD LABELS	When nonstandard output tape labels have been specified to the sort/merge program, the user must use Exit 31 or 42 to create and write the labels.	Either include the appropriate exit (E31 or E44) in the MODS statement or correct the output label designation in the LABEL entry of the OPTION statement. See message 7D90A.	None
)36I	USER GIVEN FILE SIZE EXCEEDS MAXIMUM	The specified sort work area allocated in the FILEW extent cards is not large enough to process the file size specified in the SIZE entry of the SORT control statement.	Either increase the limits specified in the work area extent cards or reduce the file size value associated with the SIZE entry. See message 7D90A.	None
)371	INPUT BLOCKSIZE NOT A MULTIPLE OF L1.	The number of bytes in an input block for fixed-length records must be a multiple of the number of bytes in each input record.	Correct either the BLKSIZE entry in the INPFIL statement or the L1 value in the RECORD statement. See message 7D90A.	None
)38I	OUTPUT BLOCKSIZE NOT A MULTIPLE OF L3.	The number of bytes in an output block for fixed-length records must be a multiple of the number of bytes in each output record.	Correct either the BLKSIZE entry in the OUTFIL statement or the L3 value in the RECORD statement. See message 7D90A.	None
D39I	A CF STARTS PRIOR TO BYTE 5 IN VARIABLE-LENGTH RECORDS.	The first four bytes of a variable-length record are the record-length field and must not be used as a control data field.	Correct the FIELDS definer complement in the SORT or MERGE control statement. See message 7D90A.	None
D40I	CONTROL FIELDS OVERLAP FOR OTHER THAN BI FORMAT	Overlapping control data fields are valid only with the unsigned binary data format.	Correct the FIELDS definer complement of the SORT or MERGE control statement. See message 7D90A.	None
D41I	RECORD LENGTH NOT SPECIFIED.	The field definer LENGTH or his value (L1) has not been specified.	Correct the error in the RECORD control statement. See message 7D90A.	None
D42I	BLOCKSIZE GREATER THAN xxxx.	The input or output block length specified is greater than the maximum acceptable to the program.	Correct the BLKSIZE entry in the INPFIL or OUTFIL control statement. See message 7D90A.	None
D43I	NOTPMK ENTRY SPECIFIED WITH STANDARD OUTPUT LABELS	The NOTPMK entry is valid for unlabeled tape output files only or tape output files with nonstandard labels.	Correct the invalid entry and restart the job.	**

*Processing continues with this parameter ignored.

7D44I	PHASE {1, 3, 4} MODIFICATION PROGRAM TOO LARGE.	The size of the user program (determined by the ADDRESS value in the MODS statement) is such that it forces the sort block size below the required minimum.	Either correct the ADDRESS entry in the MODS control statement, or specify a higher main storage load point to the Linkage Editor and re-catalog the user program. See message 7D90A.	None
7D45I	NO MEDIUM SPECIFIED FOR {INPUT, OUTPUT}	The type of input or output medium (tape or disk) has been omitted from the INFIL or OUTFIL control statement.	Correct the INPUT or OUTPUT operand entry in the appropriate control statement. See message 7D90A.	None
7D47I	{TAPE, DISK} OPTIONS SPECIFIED FOR {DISK, TAPE} {INPUT, OUTPUT}	Tape options such as OPEN, CLOSE can only be specified for tape files. Disk options such as KEYLEN and VERIFY pertain only to disk files.	Correct the erroneous control statements. See message 7D90A.	None
7D49I	NO BLOCKSIZE GIVEN FOR {INPUT, OUTPUT}	The operand definer BLKSIZ has been either incorrectly specified or omitted.	Correct or include the BLKSIZE entry in the INPFIL or OUTFIL control statement. See message 7D90A.	None
7D50I	INSUFFICIENT TRACKS GIVEN FOR MERGE.	A minimum of 2 contiguous disk tracks must be allocated for a work area for a merge-only operation.	Correct the FILEW extent card by increasing the limit of the work area. See message 7D90A.	None
7D51I	ADDROUT OPTION SPECIFIED FOR MERGE.	The ADDROUT option cannot be specified for a merge-only operation.	Either delete the ADDROUT entry from the OPTION statement or determine if the operation is to be a sort run. See message 7D90A.	None
7D53D	INVALID RESTART.	A restart sort run has been specified, but the original sort was interrupted prior to the end of phase 1.	Type IGNORE to continue processing (entire sort is rerun) or Type CANCEL to terminate the job.	Processing continues.
7D55A	INVALID RESTART. CHECK DISK PACK PLACEMENT	The disk pack(s) that contains the sort work area was not placed on a drive assigned to the identical symbolic unit used in initial run; or the sort data was destroyed after the original job.	Check and correct the disk pack placement(s) and type IGNORE to continue processing or Type CANCEL to terminate the job.	Job canceled.
7D64I	DUPLICATE STATEMENT DETECTED-xxxxxx	Two control statements contain identical statement definers. The statement definer is indicated by xxxxxx.	Delete the invalid control statement from the sort merge control statement deck. See message 7D90A.	None
7D67I	INVALID LABELS SPECIFIED FOR A DISK FILE	Disk input or output has been specified, and the labels associated with the file(s) have not been specified as standard. All disk files must contain standard file labels.	Either correct the erroneous value associated with the LABEL entry in the OPTION statement, or correct the INPUT or OUTPUT entry in the INPFIL or OUTFIL control statement.	None

)68I	{INPUT / OUTPUT} BLOCKSIZE INVALID FOR VARIABLE LENGTH RECORDS.	The input or output blocksize specified is less than the maximum input record length plus four bytes. The input or output blocksize must be equal to or greater than L1+4.	Either correct the BLKSIZE entry in the INPFIL or OUTFIL statement, or correct the L1 value in the RECORD statement.	None
)69I	SORT BLOCKSIZE MUST BE AT LEAST 300 BYTES	The size (total number of bytes) of a user program in phase 1 or phase 3 has forced the assignment phase to compute a sort blocksize that is less than 300 bytes.	Either correct the appropriate ADD value in the MODS control statement, or reduce the size of the user routine and recatalog it via the Linkage Editor.	None
)70I	INPUT OR OUTPUT BLOCKSIZE IS INVALID.	The input or output blocksize specified for a merge-only run exceeds the maximum size allowed.	Correct the BLKSIZE entry in the INPFIL or OUTFIL control statement.	None
)71I	ASSUMING BLOCKSIZE IN IS xxxx, BLOCKSIZE OUT MAY NOT EXCEED xxxx	If the input blocksize has been specified correctly, the output blocksize exceeds the maximum allowed for a merge-only operation.	If the input blocksize is accurate, correct the BLKSIZE definer in the OUTFIL statement; otherwise, correct the BLKSIZE entry in the INPFIL control statement.	None
)72I	EXIT {11 / 31 / 41 / 44} SPECIFIED FOR UNLABELED FILES.	Exist 11, 31, 41, and 44 cannot be specified for unlabeled tape files. However, for a merge-only run, Exit 41 is valid if mixed labels have been specified (at least one input file must contain standard user labels or non-standard labels).	Either correct the MODS statement by deleting parameters pertaining to the indicated exit, or correct the LABEL entry in the OPTION control statement. See message 7D90A.	None
)73I	L1 INVALID.	The input record length exceeds the maximum acceptable to the program.	Correct the L1 value in the RECORD control statement. See message 7D90A.	None
)74I	BLOCKSIZE INVALID.	The input or output blocksize exceeds the maximum allowed for a merge-only operation.	Correct the BLKSIZE entry in the INPFIL or OUTFIL control statement. See message 7D90A.	None
)75I	ONLY xx TRACKS SPECIFIED ON LAST XTENT FOR SORT.	The last extent pertaining to the sort work area contains less than four disk tracks.	Correct the last FILEW extent card (card with the highest sequence number) by allocating at least four disk tracks.	None
)76I	STORAGE LESS THAN 16,384.	The STORAGE entry in the OPTION control statement contains a value less than 16,384.	Either correct the STORAGE entry, or delete it from the OPTION control statement. See message 7D90A.	None
)77I	FILES VALUE GREATER THAN {4 / 9}	A maximum of 9 files can be sorted and a maximum of 4 files can be merged.	Correct the operand definer complement associated with the FILES entry in the SORT or MERGE control statement. See message 7D90A.	None

7D78I	MORE INPUT OR LABEL ENTRIES THAN FILES SPECIFIED	This diagnostic can only occur during a merge-only run when mixed input and/or mixed labels have been specified. The input type and label entries must agree with the number of files to be merged. For example, if 3 files are to be merged, the INPUT operand definer must reflect 3 input media (if input is mixed).	Correct the INPUT operand definer complements in the INPFIL statement and/or the input label values associated with the LABEL entry in the OPTION statement. See message 7D90A.	None
7D79I	BLOCKSIZE FOR TAPE INPUT OR OUTPUT IS LESS THAN 12.	The minimum input and output blocksize for tape operations is 12 bytes.	Either correct the BLKSIZE entry in the INPFIL or OUTFIL control statements or reblock the input file(s). See message 7D90A.	None
7D80I	END OF SORT ASSIGNMENT PHASE CALCAREA RUN.	The CALCAREA option was requested in the OPTION control statement, and the assignment phase has successfully performed the function. The results are listed on SYSLST.	This message initiates normal end-of-job proceedings.	None
7D81I	EXIT 13 SPECIFIED FOR DISK INPUT.	Exit 13 can be specified in a sort operation only when tape input has been specified.	Either delete the E13 entry from the MODS statement, or correct the INPUT entry in the INPFIL control statement. See message 7D90A.	None
7D82I	ADDROUT OPTION SPECIFIED WITH TAPE INPUT.	The ADDROUT option can be specified for a sort run only when disk input has been specified.	Either delete the ADDROUT operand definer from the OPTION statement, or correct the INPUT entry in the INPFIL statement. See message 7D90A.	None
7D83A	INVALID RESPONSE.	An invalid response to message 7D53D, 7D55A, or 7D90A has been received from the operator.	Enter a valid response. Type either RETRY, IGNORE or CANCEL.	None
7D84I	TAPE DEVICE ADDRESSES MUST BE ASSIGNED TO {SYSXXX / SYSnnn}	For a sort operation, all tape input files must reside on SYS002-SYS010, depending upon the number of files to be sorted. For a merge-only operation, tape FILEA must be on SYS002, tape FILEB must be on SYS003, etc. For tape output, SYS001 must be the output unit. The listed symbolic units are not assigned tape drive addresses.	Either assign tape devices to the listed units, or correct the INPUT or OUTPUT entry in the INPFIL or OUTFIL control statement. See message 7D90A.	None

'D85I	ALL TAPE FILES MUST HAVE UNIQUE DEVICE ADDRESSES.	The message can occur only during a merge-only run. At least 2 tape files (input and output) reside on symbolic units with an identical device address. For tape input and/or output, all tape files must reside on different tape drives; e.g., in a 2-way tape merge, FILEA must reside on SYS002, FILEB must reside on SYS003, and SYS002 and SYS003 must be assigned to different tape device addresses. If tape output is specified, SYS001 must be a tape device other than SYS002 and SYS003.	Either check and correct all erroneous symbolic units pertaining to tape files, or correct the INPUT or OUTPUT entry in the INPFIL or OUTFIL control statement. See message 7D90A.	None
D90A	OPERATOR-ATTEMPT TO CORRECT ABOVE LISTED ERRORS	This message occurs at the end of the assignment phase when errors have been detected and both SYSRDR and SYSIPT are card readers. It applies to all assignment phase diagnostic messages except 7D53D, 7D55A, 7D80I, 7D83A, and 7D92I. This facility is provided to enable the sort/merge program to be executed when it is only a job step within a specific job application. If the errors can be corrected immediately the operator should do so.	Type CANCEL if the errors cannot be corrected at this time, or a. Correct all control statement errors b. Place all job control statements and sort/merge control statements pertaining to the sort/merge program in SYSRDR and SYSIPT, respectively c. Insure that the card reader(s) is ready d. Type RETRY. Assignment phase will issue the EOJ macro, thus informing Job Control to initiate the calling of the next job step. In this case, next job step will be the sort/merge run.	Job canceled.
)91I	END OF ASSIGNMENT PHASE.	Self-explanatory.	Processing automatically continues.	None
)92I	END OF ASSIGNMENT PHASE - ERRORS DETECTED, CORRECT AND RERUN	Errors have been detected and listed by assignment phase. SYSRDR and/or SYSLST are not card readers or SYSLOG is not a 1052.	The job is canceled. Correct existing errors and rerun the job.	None
)A1I	WLR - FILEx	Phase 1 has detected a wrong-length record (block) during a read operation. x indicates the file from which the wrong length record was read. This message can occur either when the records in the input file are not the same length as those specified in L1 value of the RECORD statement or when the input BLKSIZE entry was specified incorrectly.	The wrong-length record is bypassed and processing continues. If this message continues to reappear, the job should be terminated. If the L1 value or BLKSIZE value are incorrect, correct the error and rerun the job.	None

7DA2I	PHASE 1 UNREADABLE BLOCKS BYPASSED xxxx	This message is printed at the end of phase 1 when tape input has been specified, and either the BYPASS option or Exit 13 (E13) has been specified. The message reflects the number of input blocks bypassed by the sort.	Processing continues. If the number of blocks bypassed is unacceptable (too many have been bypassed), the sort run should be terminated and rerun.	None
7DA3I	WORKAREA TOO SMALL FOR ACTUAL FILE.	The work area specified in the FILEW extent card(s) is not large enough to process the number of records contained in the input file(s). The actual number of records in the input file(s) is enumerated in message 7DA4I.	The job is terminated after message 7DA6I is printed. Correct the FILEW extent card(s) by expanding the limits so that they can contain the actual file size and rerun the job.	None
7DA4I	RECORDS PROCESSED xxxxxxx	This message indicates number of records processed (sorted internally) by phase 1. It is the actual number of records contained in the input file(s).	Processing continues unless message 7DA3I has preceded this message.	None
7DA5I	MERGE PASSES xx	xx represents the number of merge passes to be performed by phases 2 and 3.	Processing continues.	None
7DA6I	END PHASE 1	Self-explanatory.	Processing continues. The sort can be interrupted and restarted anytime after the appearance of this message.	None
7DB1I	PHASE 2, PASS xx	This message appears at beginning of each phase 2 pass. xx represents the number of the pass phase 2 is entering.	Processing continues.	None
7DC1I	PHASE 3, PASS xx	This message indicates the pass number as phase 3 is entered.	Processing continues.	None
7DC2D	SEQ. ERROR	This message should never occur. However, when it does it is interpreted as a program error. A sequence error has been detected during the merging process in phase 3.	Type IGNORE to allow processing to continue. When the end-of-job is reached, the output file should be specified as an input file, and a new sort run should be initiated or Type CANCEL to terminate the job.	Job is automatically ended.
7DC2A	INVALID RESPONSE	An invalid response has been received in reply to message 7DC2D.	Type IGNORE or CANCEL, depending upon the original decision.	None

)C4I	RECORDS PROCESSED xxxxxxx	This message indicates the number of records sorted and agrees with the number of records processed during phase 1. It does not reflect any user insertions or deletions.	Processing continues.	None
)C5I	END OF SORT	Self-explanatory.	No operator intervention required. Job Control is given control.	None
)D1I	WLR FILEx	Phase 4 has read a wrong-length record. x represents the file from which the wrong-length record was read. (See message 7DA1I for further explanation.)	See message 7DA1I.	None
)D2A	INVALID RESPONSE	An invalid reply has been received from message 7DD2D.	Type IGNORE or CANCEL, depending on the original decesion.	None
)D2D	SEQ. ERROR FILEx	A sequence error is detected in phase 4. x identifies the file with the sequence error. This message can occur either because the file was not presequenced or the control data information was incorrectly specified in the MERGE control statement.	Type IGNORE to allow processing to continue or Type CANCEL to terminate the job.	Processing continues.
)D4I	PHASE 4 UNREADABLE BLOCKS BYPASSED xxxxx	This message indicates number of input blocks bypassed during phase 4 when either the BYPASS option or Exit 45 (E45) has been specified.	Rerun the job if the number of blocks bypassed is unacceptable.	None
)D5I	RECORDS PROCESSED xxxxxxxx	This message reflects the number of records merged during phase 4. The count does not reflect any user insertions or deletions.	Processing continues.	None
D6I	END OF MERGE	Self-explanatory.	No operator intervention required. Job control is given control.	None
02I	EXCESS NO CTL CARDS	More than 25 control cards were read.	Job is automatically terminated.	None
03I	NO END CARD	END card is missing.	Job is automatically terminated.	None
0AD	**CORRECT CONTROL CARDS AND RESTART** RESPOND-RETRY OR CANCEL	An error in control cards has been detected. This message appears only when SYSIPT is assigned to a card reader.	a. Type RETRY to continue processing. (All sort control cards must be reread.) or b. Type CANCEL to terminate job.	None

7T10I	WLR	Wrong-length records were encountered and bypassed by Phase 1 of the Sort program. If the last block of an input reel is a short block, this message is printed, but the records will be processed.	None	None
7T11I	-REC PROC. xxxxxxx	xxxxxxx indicates the number of records processed during Phase 1 of the Sort program.	Processing continues.	None
7T12I	-LEVELS P2 xxx	xxx indicates the number of levels that occurred in the program. A level is that point in the program where an input tape is depleted and becomes the output tape, and old output tape becomes one of the input tapes.	Processing continues.	None
7T13I	-P1 IP BLOCKS BYPASSED xxx	xxx indicates number of unreadable blocks bypassed (one or more).	Processing continues.	None
7T14I	-END OF INTERNAL SORT	Self-explanatory.	Processing continues.	None
7T15D	-N MAX EXCEEDED BY xxxxxx	Maximum number of records to be sorted exceeded by xxxxxx.	a. Type 2 to continue sort job or b. Type any other character to terminate job.	None
7T16I	-EOF ON OUTPUT SYS00n	EOF occurred on a work drive in Phase 1 when output tapes were written. Maximum file size was exceeded, or work tapes are not full reels (2400') of tape.	Job is automatically terminated. Split the file into two or more files that do not exceed the maximum file size. Sort as separate files.	None
7T17I	-UNREADABLE BLOCK	Sort program was unable to read a block of records.	Depending on the content of a sort control statement, block can be bypassed, or job can be terminated.	None
7T18I	-REC DELETED xxxxxxxx	xxxxxxxx indicates the number of records deleted by the user in Phase 1 of the sort.	Processing continues.	None
7T19I	-VL BK	Last wrong-length record was a valid block.	Processing continues.	None
7T21I	None	Wrong-length record was read	Job automatically terminated.	None
7T22I	None	EOF occurred on a work drive in Phase 2 when output tapes were written. Maximum file size was exceeded, or work tapes not full reels (2400') of tape. Reflective marker was encountered while writing in Phase 2, not last level.	Job automatically terminated. Split the file into 2 or more files that do not exceed the maximum file size. Sort as separate files.	None

T23I	None	A tapemark has been sensed while reading backwards.	Job automatically terminated.	None
T24I	LEVEL xxxx CHKPT ON SYS00n	Checkpoint record xxxx has been written on SYS00n. xxxx begins with 0001 and is updated on each level.	Processing continues.	None
T25I	LAST LEVEL CHKPT ON SYS00n	Last checkpoint record written on SYS00n.	Processing continues.	None
T26I	SEQUENCE ERROR	Sequence error in last level.	Job is automatically terminated.	None
T27I	RECORDS IN PHASE 2 xxxxxxx	xxxxxxx indicates the number of records.	Processing continues.	None
T28I	RECORD COUNT UNEQUAL	This message occurs if the record count is unequal or if the user inserts records using Exit 23.	Processing continues.	None
T29I	END OF SORT	Self-explanatory.	Processing continues.	None
T30I	None	Wrong-length record was encountered and bypassed by Merge program.	Processing continues.	None
T31I	NO RSTRT TO 7T24I	Checkpoint and alternate work tape options have been specified and writing onto alternate work tape has begun. (At this point, input from alternate work tape for this level is no longer available.)	Processing continues. Checkpoint restart cannot be accomplished until next level message (7T24I) has been printed.	None
T32A	SEQUENCE ERROR	A sequence error has been detected on the input tape. Registers 4 and 5 contain the beginning address of the records being sequence checked.	a. Type 5 to continue merge job. b. Type any other character to terminate job.	None
T33I	RECORDS PROCESSED xxxxxxx UNREADABLE BLOCKS BYPASSED xxxx END OF MERGE	xxxxxxx indicates the number of records. xxxx indicates the number of unreadable blocks bypassed (one or more). The merge is completed.	Processing continues with next job step.	None

8001D	IS IT EOF	Tape input is specified as unlabeled and a tape mark is encountered when data is transferred.	a. Type Y if end of file. b. Type N if end of volume. (Y and N response must be upper case)	End of file assumed.
8002A	PUNCH CHECK	A punch check occurred on the card read punch (2520 or 2540).	Run out cards in punch, discard last three or four cards (for the 2520, 1 punched and two blank cards; for the 2540, 2 punched and 2 blank cards). Ready the punch and type any character to continue processing.	**
**Processing continues. The card in error and the following cards are repunched at the point the punch check occurred.				
8003A	ALTA OR ALTB PARAMETER SPECIFIED TWICE	As indicated in the message.	a. Supply correct control statement on SYSIPT and type 2 to continue processing. b. Type any character other than 2 to terminate job.	Job canceled.
8004I	// TPCP RECSIZ=(nnnnnn)	Supplied control statement is printed.	Processing continues.	None
8005A	// TPCP RECSIZ= (FORMAT IS INCORRECT)	Control statement format is invalid.	a. Supply correct control statement on SYSIPT and type 2 to continue processing. b. Type any character other than 2 to terminate job.	Job canceled.
8006A	RECORD SIZE OR REEL COUNT PARAMETER MISSING	As indicated in the message.	a. Supply control statement on SYSIPT with indicated parameter and type 2 to continue processing. b. Type any character other than 2 to terminate job.	Job canceled.
8007A	ILLEGAL RECORD SIZE OR REEL COUNT PARAMETER	Record size is greater than 5 digits, or reel count exceeds 255.	a. Supply correct control statement on SYSIPT and type 2 to continue processing. b. Type any character other than 2 to terminate job.	Job canceled.
8008A	LEADING ZERO IN RECORD SIZE OR RECORD COUNT PARAMETER	A leading zero is invalid in a control statement parameter.	a. Supply correct control statement on SYSIPT and type 2 to continue processing. b. Type any character other than 2 to terminate job.	Job canceled.
8009A	INVALID CHARACTER IN RECORD SIZE OR REEL COUNT PARAMETER	A non-numeric character is invalid in the indicated control statement parameter.	a. Supply correct control statement on SYSIPT and type 2 to continue processing b. Type any character other than 2 to terminate job.	Job canceled.

10A	PARAMETERS CONTAIN AN INVALID CHARACTER OR SEPARATORS ARE MISSING	Invalid character present in, or separators missing from, optional parameters.	a. Supply correct control statement on SYSIPT and type 2 to continue processing. b. Type any character other than 2 to terminate job.	Job canceled.
11D	NO I/O AREA AVAILABLE	Record size specified exceeds I/O area capacity.	a. Supply correct control statement on SYSIPT and type 2 to continue processing. b. Type any character other than 2 to terminate job.	Job canceled.
12A	USER EXIT SPECIFIED BUT NONE SUPPLIED	As indicated in the message.	a. Supply correct control statement on SYSIPT and type 2 to continue processing. b. Type any character other than 2 to terminate job.	Job canceled.
13A	ILLEGAL TPMK DETECTED ON FILE n	Unexpired tapemark encountered on File A or B: labeled files were specified and a tapemark preceded the label, or two tapemarks preceded either the first data record or the trailer label.	a. Supply correct control statement on SYSIPT and type 2 to continue processing. b. Type any character other than 2 to terminate tob.	Job canceled.
14A	VOLUME LABEL MISSING ON FILE n	Label handling was specified, but a volume label was not found on File A or File B.	a. Supply correct control statement on SYSIPT and type 2 to continue processing. b. Type any character other than 2 to terminate job.	Job canceled.
15A	HEADER LABEL MISSING ON FILE n	A specified header label is missing on File A or File B.	a. Supply correct control statement on SYSIPT and type 2 to continue processing. b. Type any character other than 2 to terminate job.	Job canceled.
16A	TRAILER LABEL MISSING ON FILE n	Label handling was specified, but a trailer label was not found on File A or File B.	a. Supply correct control statement on SYSIPT and type 2 to continue processing. b. Type any character other than 2 to terminate job.	Job canceled.
17D	EOF ON UNLABELED FILES	A tapemark was detected on on unlabeled file and the reel count is depleted.	a. Supply control statement on SYSIPT and type 2 to continue processing. b. Type any character other than 2 to terminate job.	Job canceled.
18D	EOF ON FILE A AND NOT ON B	File A is shorter than File B for labeled files.	a. Supply control statement on SYSIPT and type 2 to continue processing. b. Type any character other than 2 to terminate job.	Job canceled.

8019D	EOF ON FILE B AND NOT ON A	File B is shorter than File A for labeled files.	a. Supply control statement on SYSIPT and type 2 to continue processing. b. Type any character other than 2 to terminate job.	Job canceled.
8020A	CHANGE REEL ON PRIMARY A	An alternate reel was not assigned to primary A.	Change the reel and type any character to continue processing.	Processing continues.
8021I	SWITCHING TO ALTERNATE A	Primary reel is completed and processing continues with alternate reel.	Processing continues.	Processing continues.
8022A	CHANGE REEL ON PRIMARY B	An alternate reel was not assigned to primary B.	Change the reel and type any character to continue processing.	Processing continues.
8023I	SWITCHING TO ALTERNATE B	Primary reel is completed and processing continues with alternate reel.	Processing continues.	Processing continues.
8024D	REEL COUNT DEPLETED	The reel count is depleted on a labeled file and no EOF trailer label was sensed.	a. Supply control statement on SYSIPT and type 2 to continue processing. b. Type any character other than 2 to terminate job.	Job canceled.
8025A	RESTART WAS REQUESTED	The interrupt key was pressed during execution.	a. Type a blank to continue processing. b. Supply new control statement on SYSIPT and type 2 to restart. c. Type any character other than blank or 2 to terminate job.	Job canceled.
8026D	EOF ON LABELED FILES	An end of file trailer label has been detected on both files.	a. Supply control statement on SYSIPT and type 2 to continue processing. b. Type any character other than 2 to terminate job.	Job canceled.
8027A	CONTROL CARD MISSING	TPCP control statement was omitted.	a. Supply TPCP control statement on SYSIPT and type 2 to continue processing. b. Type any character other than 2 to terminate the job.	Job canceled.

Note: The complete format of multiprogramming utility macro messages 8502 through 8590 is as follows:

85xyz
8: Identifies a utility message.
5: Indicates a macro message.
x: Message code.
y: Macro code.

y= 0 General
= 1 INCARD
= 2 INTAPE
= 3 INDISK
= 4 INLOG
= 5 OUTCARD
= 6 OUTAPE
= 7 OUTDISK
= 8 OUTPRINT
= 9 OUTLOG

z: Operator option.

z= A if operator Action is required.
= D if operator Decision is required.

NO.	MESSAGE	CAUSE	ACTION	DEFAULT
8502D	BLOCK LENGTH EXCEEDS BUFFER SIZE-INTAPE	Record exceeds I/O area capacity.	Type IGNORE to accept truncated record, or Type CANCEL or Ⓑ to cancel the job.	Job canceled.
8503D	BLOCK LENGTH EXCEEDS BUFFER SIZE-INDISK	Record exceeds I/O area capacity.	Type IGNORE to accept truncated record, or Type CANCEL or Ⓑ to cancel the job.	Job canceled.
8506D	RECORD LENGTH EXCEEDS BUFFER SIZE-OUTAPE	Record exceeds I/O area capacity.	Type IGNORE to accept truncated record, or Type CANCEL or Ⓑ to cancel the job.	Job canceled.
8507D	RECORD LENGTH EXCEEDS BUFFER SIZE-OUTDISK	Record exceeds I/O area capacity.	Type IGNORE to accept truncated record, or Type CANCEL or Ⓑ to cancel the job.	Job canceled.
8512D	INCOMPLETE LOGICAL RECORD IN BLOCK-INTAPE	The block residue is less than the logical record length.	Type IGNORE to accept the residual data, or Type CANCEL or Ⓑ to cancel the job.	Job canceled.
8513D	INCOMPLETE LOGICAL RECORD IN BLOCK-INDISK	The block residue is less than the logical record length.	Type IGNORE to accept the residual data, or Type CANCEL or Ⓑ to cancel the job.	Job canceled

8515D	RECORD LENGTH OVER 80-OUTCARD	Record exceeds I/O area capacity.	Type IGNORE to accept truncated record, or Type CANCEL or Ⓑ to cancel the job.	Job canceled.
8516D	RECORD LENGTH EXCEEDS BUFFER RESIDUE-OUTAPE	Buffer residue is less than the logical record length.	Type IGNORE to place logical record in next output block, or Type CANCEL or Ⓑ to cancel the job.	Job canceled.
8517D	RECORD LENGTH EXCEEDS BUFFER RESIDUE-OUTDISK	Buffer residue is less than the logical record length.	Type IGNORE to place logical record in next output block, or Type CANCEL or Ⓑ to cancel the job.	Job canceled.
8518D	RECORD LENGTH EXCEEDS BUFFER SIZE-OUTPRT	Record exceeds I/O area capacity	Type IGNORE to accept truncated record, or Type CANCEL or Ⓑ to cancel the job.	Job canceled.
8522A	TAPE MARK ON UNLABELED FILE-INTAPE	Self-explanatory.	Type EOV to rewind and unload the tape. An intervention-required message 0P08 will be issued. Mount next reel and ready tape drive to continue processing, or Type EOF or Ⓑ. This implies no further input from this drive.	Job canceled.
8525D	IMPROPER STACKER SELECT CHARACTER-OUTCARD	First character not V or W.	Type IGNORE to accept as W (stacker 2), or Type CANCEL or Ⓑ to cancel the job.	Job canceled.
8526I	END OF REEL ON UNLABELED FILE-OUTAPE	Self-explanatory.	This message is always followed by message 0P08. Mount another reel to continue processing.	None
8535A	2540 PUNCH CHECK-OUTCARD	A punch check occurred on 2540 card read punch.	Type CANCEL to terminate processing, or {Ⓑ / RETRY} to repunch and continue. For RETRY, run out the cards in the punch and discard the last five cards in stacker 1. Ready the punch.	Job canceled.

8545A	2520 PUNCH CHECK-OUTCARD	A punch check occurred on 2520 card read punch.	Type CANCEL to terminate processing, or {Ⓑ / RETRY} to repunch and continue. For RETRY, run out the cards in the punch and discard the last four cards in stacker 1. Ready the punch.	Job canceled.
8555A	2520 PUNCH CHECK-OUTCARD	A punch check occurred on on 2520 card read punch.	Type CANCEL to terminate processing, or {Ⓑ / RETRY} to repunch and continue. For RETRY, run out cards in the punch and discard the last three cards in stacker 1 and 1 card in stacker 2. Ready punch.	Job canceled.
8590A	INVALID RESPONSE	Operator response to previous utility-macro message (85xxx) invalid.	Type a valid response.	None
8V00A	INVALID STATEMENT	Unrecognizable statement read from card reader assigned to SYSIPT.	a. Supply correct control statement on SYSIPT and type Y to continue processing. b. Type any character except Y to terminate the job.	None.
8V00I	INVALID STATEMENT	Unrecognizable statement read from tape unit assigned to SYSIPT.	Job canceled.	Job canceled.
8V01I	INVALID PARAMETER xxxxxx	Expected numerical field is not numeric.	Job canceled.	Job canceled.
8V02A	INVALID TABLE NAME	Table name in statement read from card reader assigned to SYSIPT has incorrect format.	a. Supply correct control statement on SYSIPT and type Y to continue processing. b. Type any character except Y to terminate the job.	None.
8V02I	INVALID TABLE NAME	Table name in statement read from tape unit assigned to SYSIPT has incorrect format.	Job canceled.	Job canceled.
8V03A	INVALID SPARE TRACK PARAMETER	Number of spare tracks allocated to a table in a SELECT statement read from card reader (SYSIPT) exceeds 255.	a. Supply correct control statement on SYSIPT and type Y to continue processing. b. Type any character except Y to terminate the job.	None.

8V03I	INVALID SPARE TRACK PARAMETER	Number of spare tracks allocated to a table in a SELECT statement read from tape unit assigned to SYSIPT exceeds 255.	Job canceled.	Job canceled.
8V04I	INVALID SEPARATOR	Incorrect separator used.	Job canceled.	Job canceled.
8V05I	INVALID INPUT VOCABULARY PARAMETER	Input vocabulary parameter in VOC BL statement has incorrect format.	Job canceled.	Job canceled.
8V06I	INVALID WORD IDENTIFIER xxxxxx	Invalid word identifier used.	Job canceled.	Job canceled.
8V07I	INVALID WORD IDENTIFIER SEQUENCE xxxxxx	Invalid word identifier sequence used.	Job canceled.	Job canceled.
8V08A	INVALID CONTINUATION CARD	First 15 columns of a continuation card read from card reader assigned to SYSIPT are not blank.	a. Provide correct continuation card and type Y to continue processing. b. Type any character except Y to terminate the job.	None.
8V08I	INVALID CONTINUATION CARD	First 15 columns of a continuation card read from tape unit assigned to SYSIPT are not blank.	Job canceled.	Job canceled.
8V09A	TABLE NOT FOUND	Table specified in statement read from card reader assigned to SYSIPT is not in Operative Vocabulary File.	a. Provide correct statement and type Y to continue processing. b. Type any character except Y to terminate the job.	None.
8V09I	TABLE NOT FOUND	Table specified in statement read from tape unit assigned to SYSIPT is not in Operative Vocabulary File.	Job canceled.	Job canceled.
8V10A	INVALID UPDATE OPERATION	Attempt to insert a word in the residuum has been made by means of the card reader assigned to SYSIPT	a. Provide valid statement and type Y to continue processing. b. Type any character except Y to terminate the job.	None.
8V10I	INVALID UPDATE OPERATION	Attempt to insert a word in the residuum has been made by means of a tape unit assigned to SYSIPT.	Job canceled.	Job canceled.
8V11A	INVALID WORD LOCATION	Word location in MODIFY statement read from card reader assigned to SYSIPT is incorrect.	a. Provide correct statement and type Y to continue processing. b. Type any character except Y to terminate the job.	None.

8V11I	INVALID WORD LOCATION	Word location in MODIFY statement read from tape unit assigned to SYSIPT is incorrect.	Job canceled.	Job canceled.
8V12A	WORD xxxxxx NOT FOUND	Word in MODIFY statement read from card reader assigned to SYSIPT is not in Input Vocabulary File (SYS004).	a. Mount correct Input Vocabulary File and type Y to continue processing. b. Type any character except Y to terminate the job.	None.
8V13A	INPUT VOCABULARY MISSING ON SYSxxx	Input vocabulary is not present on card reader assigned to SYSIPT or on tape unit assigned to SYS004.	a. Provide vocabulary deck or tape and type Y to continue processing. b. Type any character except Y to terminate the job.	None.
8V13I	INPUT VOCABULARY MISSING ON SYSIPT	Input vocabulary is not present on tape unit assigned to SYSIPT.	Job canceled.	Job canceled.
8V14A	INVALID VOCABULARY SEQUENCE	Vocabulary deck has incorrect sequence.	a. Put vocabulary records in proper sequence and type Y to continue processing. b. Type any character except Y to terminate the job.	None.
8V14I	INVALID VOCABULARY SEQUENCE	Vocabulary on tape unit assigned to SYSIPT has incorrect sequence.	Job canceled.	Job canceled.
8V15D	EXCESSIVE WORD LENGTH xxxxxx	Word exceeds either the available buffer size or the track capacity of IBM 2311 Disk Storage Drive.	a. Type Y to skip word and continue processing. b. Type any character except Y to terminate the job.	None.
8V16D	WORD xxxxxx NOT FOUND	Word specified by word identifier xxxxxx is not in Input Vocabulary File	a. Type Y to continue processing. b. Type any character except Y to terminate the job.	None.
8V17I	OVERFLOW ON VOCRES	Insufficient space on disk containing Operative Vocabulary File.	Job canceled.	Job canceled.
8V18I	OVERFLOW ON VOCUT	Insufficient space on disk allocated to utility work file.	Job canceled.	Job canceled.
8V19I	TAPE READ ERROR	Unrecoverable read error.	Job canceled.	Job canceled.

8V20I	READ ERROR ON VOCRES	Unrecoverable read error while reading Operative Vocabulary File.	Job canceled.	Job canceled.
8V21I	READ ERROR ON VOCUT	Unrecoverable read error while reading utility work file.	Job canceled.	Job canceled.
8V22I	INVALID VOCRES ASSIGNMENT	File described as VOCRES is not an Operative Vocabulary File.	Job canceled.	Job canceled.
8V23I	INVALID SYSLST ASSIGNMENT	Device assigned to SYSLST cannot be handled.	Job canceled.	Job canceled.
8V24I	INVALID SYSIPT ASSIGNMENT	Device assigned to SYSIPT cannot be handled.	Job canceled.	Job canceled.
8V25I	INVALID OR MISSING UPSI STATEMENT	Self-explanatory.	Job canceled.	Job canceled.
8V26I	UPDATE OPERATION REJECTED	Vocabulary table or residuum cannot be modified because of insufficient space on disk.	Job canceled.	Job canceled.
8V27I	TOO MANY EXTENTS FOR VOCRES	More than one XTENT statement provided for VOCRES.	Job canceled.	Job canceled.
8V28I	TOO MANY XTENTS FOR VOCUT	More than one XTENT statement provided for VOCUT.	Job canceled.	Job canceled.
8V29I	MAXIMUM WORD LENGTH xxxx	Self-explanatory.	Processing continues.	None.
8V30I	xxxx WORDS NOT FOUND	Number of words selected by the user but not contained in the Input Vocabulary File.	Processing continues.	None.
8V31I	TABLE xxxxxxxx NOT CREATED	Words to be included in the table are not in the Input Vocabulary File.	Processing continues.	None.

Note: Statements in error (messages 9100I to 9170I) are printed in the following formats.

1. If there is no 12-2-9 code in column 1 of the card image, columns 2-80 of the card image are printed in EBCDIC.
2. If there is a 12-2-9 code in column 1 of the card image:

Print Positions	Contains Card Image Columns
8-15	73-80 (identification) in EBCDIC
17-19	2-4 (card type) in EBCDIC
21-26	6-8 (assembled origin) in hexadecimal
28-31	11-12 (number of bytes in card image) in hexadecimal
33-36	15-16 (ESID number) in hexadecimal

The remainder of the line depends on the type of card image (ESD or non-ESD).

a. If non-ESD type card image, print positions 38-128 are printed from columns 17-52. These positions are printed in hexadecimal in blocks of 9 words (36 bytes) separated by one block.
b. If ESD type card image, print positions 38-128 contain 3 fields of ESD information. Each field is 16 columns, which are as follows:

Columns	Contains
17-24	ESD item name in EBCDIC
25	ESD type in EBCDIC
26-28	Assembled origin in hexadecimal
30-32	Length/ESD number in hexadecimal

The action taken by the system when these messages are issued depends upon the option specified in the Linkage Editor ACTION statement. If CANCEL is specified as the operand of the ACTION statement, the job will be canceled. If CANCEL is not specified in the ACTION statement, processing continues.

NO.	MESSAGE	CAUSE
9100I	Content of statement in error.	Invalid input card type.
9101I	Content of statement in error	Invalid operation in control statement.
9102I	Content of statement in error	Non-decimal or non-hexadecimal character in decimal or hexadecimal field.
9110I	Content of statement in error.	Invalid or missing field limiter on control statement.
9111I	Content of statement in error.	An operand field is greater than the maximum length on a user-prepared control statement or REP card.
9112I	Content of statement in error.	An operand field is missing.
9113I	Content of statement in error.	Control statement extends beyond column 71.
9114I	Content of statement in error.	Submodular namelist is too long.
9115I	Content of statement in error.	NOAUTO expected, but not found.
9116I	Content of statement in error.	Control statement present between first ESD and END statements of a module.
9120I	Content of statement in error.	Phase name duplicated.
9121I	Content of statement in error.	Phase name lower in sequence than $$A or phase name begins with an *.

9122I	Content of statement in error.	a. Symbol or phasename designated in origin was not previously defined. b. An F parameter has been detected in a phase card. (Autotest will not operate in a foreground environment
9123I	Content of statement in error.	Previous phase processed contained no valid storage assignment.
9124I	Content of statement in error.	Phase origin is negative.
9125I	Content of statement in error.	PHASE statement encountered during AUTOLINK.
9130I	Content of statement in error.	Relocatable library not present.
9131I	Content of statement in error.	Module requested by INCLUDE statement not present in relocatable library.
9132I	Content of statement in error.	Too many nesting levels of INCLUDE attempted.
9133I	Content of statement in error.	Nested submodular INCLUDE.
9135I	Content of statement in error.	ACTION statement has invalid operand.
9136I	Content of statement in error.	ACTION MAP specified, but SYSLST was not assigned.
9140I	Content of statement in error.	ESD item of invalid type.
9141I	Content of statement in error	Duplicated ESID number: 1. No END statement in last module. 2. Duplicate ESD cards. 3. Extraneous ESD card.
9142I	Content of statement in error.	ESD entry point label does not point to ESD named control section or COMMON.
9143I	Content of statement in error.	Invalid duplication of entry point label.
9144I	Content of statement in error.	Invalid ESID number, or control dictionary and linkage table overlap.
9145I	Content of statement in error.	Origin of control section not on a doubleword boundary.
9146I	Content of statement in error.	COMMON has the same label as a named control section or an entry point label.
9147I	Content of statement in error.	ESD entry point label does not belong to a defined control section.
9150I	Content of statement in error.	Load address encountered outside phase.
9151I	Content of statement in error.	Invalid delimiter on REP card.
9155I	Content of statement in error.	The TXT or REP card or address constant in an RLD record does not have an ESID pointer to a defined control section.
9156I	Content of statement in error.	Invalid format of RLD card.
9158I	Content of statement in error.	END statement should contain the length of the control section, but does not.
9170I	Content of statement in error.	ESID number not previously processed.

200I	LINKAGE EDITOR CANNOT CONTINUE	a. Highest byte of user program would overlay the area reserved for the Autotest control program at user program execution time. b. The user phase to be fetched would be located wholly or partially in the Supervisor area.	Job canceled.	None.
201I	LINKAGE EDITOR CANNOT CONTINUE	Required Autotest phase not found in core image library.	Job canceled.	None.
202I	LINKAGE EDITOR CANNOT CONTINUE	All of user's core is not allocated to Autotest (the background area).	Job canceled.	None
203I	SYM OUT OF ORDER	Error in symbol processing. (Sym cards out of sequence.)	Processing continues. All symbols ignored.	None.
281I	LINKAGE EDITOR CANNOT CONTINUE	No valid storage assignment in final phase.	Job canceled.	None.
282I	LINKAGE EDITOR CANNOT CONTINUE	No END record encountered before ENTRY statement.	Job canceled.	None.
285I	LINKAGE EDITOR CANNOT CONTINUE	An error occurred during the linkage editing of a $ phase.	Job canceled.	None.
291I	LINKAGE EDITOR CANNOT CONTINUE	1. End of file or extents exceeded on SYS001. 2. SYS001 not assigned to disk or tape.	Job canceled.	None
292I	LINKAGE EDITOR CANNOT CONTINUE	End of librarian work area. Too many phases to process.	Job canceled.	None.
293I	LINKAGE EDITOR CANNOT CONTINUE	Core image library space exceeded.	Job canceled.	None.
294I	LINKAGE EDITOR CANNOT CONTINUE	Disk error -- an invalid no-record-found condition occurred.	Job canceled.	None.
299I	ERROR HAS OCCURRED DURING LINKAGE EDITING	Printed on SYSLOG if any errors 9100I through 9170I have occurred. These messages appear on SYSLST	Job will continue if. ACTION CANCEL option is not specified. Otherwise, job is canceled	None
900I	DISK WORK AREA INVALID	a. Minimum work area size requirement not met. (In most cases, 30 tracks are required, allocate more if possible.) b. Work Area not assigned to SYSLNK.	Job canceled.	None.
901I	DISK WORK AREA TOO SMALL	Insufficient work area for SYM card input. Processing continues without symbolic capability.	Processing continues, without symbolic capability.	None.

9902I	DISK WORK AREA TOO SMALL	a. Insufficient work area detected while writing Linkage Editor Control Dictionary onto disk. b. No work area remains for phase fetch/load records and test request output.	Job canceled.	None
9903I	DISK WORK AREA TOO SMALL	Test request control records or patch area records exceed capacity of work area.	Job canceled.	None
9A01I	AUTOTEST CANNOT CONTINUE	All user's main storage not allocated to Autotest. A change in core allocation has taken place by means of Job Control before the execution of a // EXEC card.	Job canceled.	None
9A02I	OPTION CATAL IGNORED	User supplied OPTION CATAL.	Option ignored by Post-Linkage Editor, Processing continues.	None
9F02I	AUTOTEST COMMUNICATION RECORD NOT ON SYSLINK	The Disaster Continue routine has detected a wrong-length record in the first Autotest record of the Autotest work file (SYSLNK). (The user program has written over Autotest information.)	Job canceled.	None
9J01I	EOV ON SYS005	End of volume on SYS005 (output tape) during Card to Tape variable program.	Job canceled.	None

A110I	ABORT -PERM. I/O ERROR ON SYSxxx	Unrecoverable I/O error.	Job canceled.	None
A111I	ABORT -UNEXPECTED EOF ON SYSxxx	EOF has occurred on a system work file.	Job canceled.	None
A112I	ABORT -INADEQUATE CORE FOR 32K ASSEMBLER	The background area is less than 14K.	Job canceled	None
A113I	ABORT -INVALID PHYSICAL UNIT SYS00x	The assembler was linkage edited for a different device type on system work file than is specified on ASSGN card. NOTE: Only highest numbered system unit is flagged by this message.	Job canceled.	None
3001A	PAUSE nnnnn	FORTRAN object program has requested a pause in processing.	Perform requested operation. Type Ⓑ to continue processing.	Pause will not occur.
3002I	STOP nnnnn	End of FORTRAN object program.	Processing continues with next job.	None
C001I	CONFLICTING I/O ASSIGNMENTS	SYS001, SYS002, SYS003 must be assigned to the same type of device -- either tape or disk.	Job canceled.	None
C002I	STORAGE ALLOCATED TO THE COMPILER IS LESS THAN 14K. COMPILATION CANCELED.	COBOL cannot be executed if the storage allocated to the background area is less than 14K bytes.	Job canceled.	None

<table>
<tr><th>Name</th><th>Operation</th><th>Operation</th><th>72</th><th>Remarks</th></tr>
<tr><td>//</td><td>JOB</td><td>jobname</td><td>b</td><td>jobname: one to eight alphameric characters</td></tr>
<tr><td>//</td><td>EXEC</td><td>[progname]</td><td>b</td><td>progname: one to eight alphameric characters. Used only if the program is in the core image library.</td></tr>
<tr><td>//</td><td>ASSGN</td><td>SYSxxx,address [{,X'ss' / ,ALT}]</td><td>b</td><td>SYSxxx: can be SYSRDR
SYSIPT
SYSIN
SYSPCH
SYSLST
SYSLOG
SYSLNK
SYS000-SYS244

address: can be X'cuu', UA, or IGN

X'cuu': c = 0-6
uu = 00=FE (0-254) in hex

UA: unassign

IGN: unassign and ignore

X'ss': used for magnetic tape only

<table><tr><th>ss</th><th>Bytes per Inch</th><th>Parity</th><th>Translate Feature</th><th>Convert Feature</th></tr><tr><td>10</td><td>200</td><td>odd</td><td>off</td><td>on</td></tr><tr><td>20</td><td>200</td><td>even</td><td>off</td><td>off</td></tr><tr><td>28</td><td>200</td><td>even</td><td>on</td><td>off</td></tr><tr><td>30</td><td>200</td><td>odd</td><td>off</td><td>off</td></tr><tr><td>38</td><td>200</td><td>odd</td><td>on</td><td>off</td></tr><tr><td>50</td><td>556</td><td>odd</td><td>off</td><td>on</td></tr><tr><td>60</td><td>556</td><td>even</td><td>off</td><td>off</td></tr><tr><td>68</td><td>556</td><td>even</td><td>on</td><td>off</td></tr><tr><td>70</td><td>556</td><td>odd</td><td>off</td><td>off</td></tr><tr><td>78</td><td>556</td><td>odd</td><td>on</td><td>off</td></tr><tr><td>90</td><td>800</td><td>odd</td><td>off</td><td>on</td></tr><tr><td>A0</td><td>800</td><td>even</td><td>off</td><td>off</td></tr><tr><td>A8</td><td>800</td><td>even</td><td>on</td><td>off</td></tr><tr><td>B0</td><td>800</td><td>odd</td><td>off</td><td>off</td></tr><tr><td>B8</td><td>800</td><td>odd</td><td>on</td><td>off</td></tr><tr><td>C0</td><td>800</td><td colspan="3">single density 9-track tape</td></tr><tr><td>C0</td><td>1600</td><td colspan="3">dual density 9-track tape</td></tr><tr><td>C8</td><td>800</td><td colspan="3">dual density 9-track tape</td></tr></table>
ALT: specifies alternate unit</td></tr>
<tr><td>//</td><td>RESET</td><td>{SYS / PROG / ALL / SYSxxx}</td><td>b</td><td>Resets I/O device assignments</td></tr>
<tr><td>//</td><td>DATE</td><td>mm/dd/yy
or
dd/mm/yy</td><td>b</td><td>mm: month (01-12)
dd: day (01-31)
yy: year (00-99)</td></tr>
<tr><td>//</td><td>UPSI</td><td>nnnnnnnn</td><td>b</td><td>n: 0, 1, or X</td></tr>
<tr><td>//</td><td>VOL</td><td>SYSxxx,filename</td><td>b</td><td>SYSxxx: can be SYS000-SYS244

filename: one to seven alphabetic characters</td></tr>
</table>

Name	Operation	Operand	72	Remarks
//	DLAB	'label fields 1-3', xxxx,yyddd,yyddd,'system code' [,type]	C	'label fields 1-3': first three fields of Format 1 DASD file label. Is a 51-byte character string, contained within apostrophes and followed by a comma. Entire 51-byte field must be contained in the first of the two statements. Field 1 is the file name (44-byte alphameric); field 2 is the format identifier (1-byte numeric); field 3 is the file serial number (6-byte alphameric). C: any non-blank character in column 72 xxxx: volume sequence number (4-digit numeric). Must begin in column 16 of the continuation statement. Columns 1-15 are blank. yyddd,yyddd: file creation date followed by file expiration date. Each is 5-digit numeric. 'system code': not required. When used, a 13-character string, within apostrophes. type: SD, DA, ISC, or ISE. If omitted, SD is assumed.
//	XTENT	type,sequence,lower,upper, 'serial no.',SYSxxx [,B_2]	⊬	type: 1 for data area (no split cylinder) 2 for overflow area (for indexed sequential file) 4 for index area (for indexed sequential file) 128 for data area (split cylinder) sequence: sequence number of extent within multi-extent file. Can be 0 to 255. lower: lower limit of extent in the form $B_1C_1C_1C_2C_2C_2H_1H_2H_2$ where: B_1 = 0 for 2311; 0-9 for 2321 C_1C_1 = 00 for 2311; 0-9 for 2321, $C_2C_2C_2$ = 000-199 for 2311; 000-009 for 2321 H_1 = 0 for 2311; 0-4 for 2321 H_2H_2 = 00-09 for 2311; 00-19 for 2321 All zeros are invalid. upper: upper limit of extent in the same form as for lower limit. 'serial no.': 6-alphameric-character volume serial number contained within apostrophes. SYSxxx: can be SYS000-SYS244 B_2: 0 for 2311; 0-9 for 2321
//	TPLAB	'label fields 3-10'	⊬	'label fields 3-10': indicated fields of the standard tape file label. A 49-byte character string, contained within apostrophes.
//	TPLAB	'label fields 3-10 label fields 11-13'	C	'label fields 3-10: same as above C: any non-blank character in column 72 label fields 11-13': 20-character direct continuation of the same character string begun with fields 3-10 (no blanks, apostrophes, or commas separating)

Name	Operation	Operand	72	Remarks
//	LBLTYP	{TAPE [(nn)] {NSD (nn)	⌀	TAPE: used when tape files requiring label information are to be processed and no non-sequential disk files are to be processed. nn : optional and is present only for future expansion (it is ignored by Job Control) NSD: non-sequential disk files are to be processed nn : largest number of extents per single file
//	RSTRT	SYSxxx,nnnn	⌀	SYSxxx: symbolic unit name of the device on which the checkpoint records are stored. Can be SYS000-SYS244. nnnn: four character identification of the checkpoint record to be used for restarting
//	LISTIO	{SYS PROG F1 F2 ALL SYSxxx UNITS DOWN UA X'cuu'}	⌀	Causes listing of I/O assignments on SYSLST
//	MTC	opcode,SYSxxx[,nn]	⌀	opcode: BSF, BSR, ERG, FSF, FSR, REW, RUN, or WTM SYSxxx: any logical unit nn: decimal number (01 = 99)
//	OPTION	option1 [,option2,...]	⌀	option: can be any of the following LOG — Log control statements on SYSLST NOLOG — Suppress LOG option DUMP — Dump registers and main storage on SYSLST in the case of abnormal program end NODUMP — Suppress DUMP option LINK — Write output of language translator on SYSLNK for linkage editing NOLINK — Suppress LINK option DECK — Output object module on SYSPCH NODECK — Suppress DECK option LIST — Output listing of source module on SYSLST NOLIST — Suppress LIST option LISTX — Output listing of object module on SYSLST NOLISTX — Suppress LISTX option SYM — Punch symbol deck on SYSPCH NOSYM — Suppress SYM option XREF — Output symbolic cross-reference list on SYSLST NOXREF — Suppress XREF option ERRS — Output listing of all errors in source program on SYSLST NOERRS — Suppress ERRS option CATAL — Catalog program or phase in core image library after completion of Linkage Editor run STDLABEL — Causes all sequential disk or tape labels to be written on the standard label track USRLABEL — Causes all sequential disk or tape labels to be written on the user label track 48C — 48-character set 60C — 60-character set
//	PAUSE	[comments]	⌀	PAUSE statement is always printed on 1052 (SYSLOG). If no 1052 is available, the statement is ignored.
/*	ignored	ignored	⌀	Columns 1 and 2 are the only columns checked
/&	ignored	ignored	⌀	Column 3 must be blank
*		comments	⌀	Column 2 must be blank

Operator Commands[1]				System Communication	Job Control Statement[2]
IPL	JC[3]	AR[4]	FI[5]		
X				ADD	
	X	X		ALLOC	
	X		X	ASSGN	X
X[6]	X[6]	X[6]	X[6]	Ⓑ	
X[6]	X[6]	X[6]	X[6]	Ⓒ	
	X	X	X	CANCEL	
	X			CLOSE	
				DATE	X
X				DEL	
			X	DLAB	X
	X			DVCDN	
	X			DVCUP	
			X	EXEC	X
	X		X	HOLD	
				JOB	X
				LBLTYP	X
	X		X	LISTIO	X
	X	X	X	LOG	
	X	X		MAP	
		X		MSG	
	X			MTC	X
	X	X	X	NOLOG	
				OPTION	X
	X	X		PAUSE	X
			X	READ	
	X		X	RELSE	
	X			RESET	X
X	X			SET	

Operator Commands[1]				System Communication	Job Control Statement[2]
		X		START	
	X			STOP	
		X		TIMER	
			X	TPLAB	X
	X		X	UCS	
	X		X	UNA	
				UPSI	X
			X	VOL	X
			X	XTENT	X
				/*	X[7]
				/&	X[7]
				*	X[7]

[1]Entered through SYSRDR or SYSLOG (never preceded by a //)

[2]Entered through SYSRDR (always preceded by a //)

[3]JC Job control (background)

[4]Attention routine

[5]Foreground initiation

[6]Entered through SYSLOG only

[7]Never preceded by //

Part I. IPL Commands (Initial Program Load)

<table>
<tr><th>Operation</th><th>Operand</th><th>Remarks</th></tr>
<tr><td>ADD</td><td>X'cuu' [(k)] ,devicetype [,X'ss']</td><td>X'cuu' = channel and unit numbers

k = S, if the device can be switched (physically attached to two adjacent channels). The designated channel is the lower of the two channels.

k = 0 - 255 indicates the priority of a device that cannot be switched. If k is not given, a priority of 255 is assumed. In a multi-programming environment all devices have equal priority.

devicetype = (see table below)

<table>
<tr><th>Card Code</th><th>Actual Device</th></tr>
<tr><td>2400T9</td><td>Nine track tapes</td></tr>
<tr><td>2400T7</td><td>Seven track tapes</td></tr>
<tr><td>1442N1</td><td>1442N1 Card Reader Punch</td></tr>
<tr><td>2520B1</td><td>2520B1 Card Reader Punch</td></tr>
<tr><td>2501</td><td>2501 Card Reader</td></tr>
<tr><td>2540R</td><td>2540 Card Reader</td></tr>
<tr><td>2540P</td><td>2540 Card Punch</td></tr>
<tr><td>2520B2</td><td>2520B2 Card Punch</td></tr>
<tr><td>1442N2</td><td>1442N2 Card Punch</td></tr>
<tr><td>2520B3</td><td>2520B1 Card Punch</td></tr>
<tr><td>1403</td><td>1403 Printer</td></tr>
<tr><td>1403U</td><td>1403 Printer with UCS</td></tr>
<tr><td>1404</td><td>1404 Printer</td></tr>
<tr><td>1443</td><td>1443 Printer</td></tr>
<tr><td>1445</td><td>1445 Printer</td></tr>
<tr><td>1050A</td><td>1052 Printer-Keyboard</td></tr>
<tr><td>UNSP</td><td>Unsupported device if attached to Channel 0, not overrunnable, and not operated in burst mode.</td></tr>
<tr><td>UNSPB</td><td>Unsupported device attached to Channel 0, which is either overrunnable or operates in burst mode.</td></tr>
<tr><td>2311</td><td>2311 Disk Drive</td></tr>
<tr><td>2321</td><td>2321 Data Cell Drive</td></tr>
<tr><td>2701</td><td>2701 Line Adaptor Unit</td></tr>
<tr><td>2702</td><td>2702 Trans. Control Unit</td></tr>
<tr><td>2703</td><td>2703 Trans. Control Unit</td></tr>
<tr><td>7770</td><td>7770 Trans. Control Unit</td></tr>
<tr><td>7772</td><td>7772 Trans. Control Unit</td></tr>
<tr><td>2260</td><td>1. Local display station
2. 1053 attached to 2848</td></tr>
<tr><td>2671</td><td>2671 Paper Tape Reader</td></tr>
</table>

X'ss' = device specifications
If absent, the following values are assumed.
X'C0' for 9-track tapes
X'90' for 7-track tapes
X'00' for non-tapes

2702-MODE designates the SADxxx command
X'00' SAD0
X'01' SAD1
X'02' SAD2
X'03' SAD3</td></tr>
</table>

Appendix C: Part I (1 of 2)

<table>
<tr><th>Operation</th><th>Operand</th><th>Remarks</th></tr>
<tr><td></td><td></td><td>The tape specifications are:
<table>
<tr><th>Density (Bytes per Inch)</th><th>Parity</th><th>Convert Feature</th><th>Translate</th><th>ss</th></tr>
<tr><td>200</td><td>odd</td><td>on</td><td>off</td><td>10</td></tr>
<tr><td>200</td><td>odd</td><td>off</td><td>off</td><td>30</td></tr>
<tr><td>200</td><td>odd</td><td>off</td><td>on</td><td>38</td></tr>
<tr><td>200</td><td>even</td><td>off</td><td>off</td><td>20</td></tr>
<tr><td>200</td><td>even</td><td>off</td><td>on</td><td>28</td></tr>
<tr><td>566</td><td>odd</td><td>on</td><td>off</td><td>50</td></tr>
<tr><td>556</td><td>odd</td><td>off</td><td>off</td><td>70</td></tr>
<tr><td>556</td><td>odd</td><td>off</td><td>on</td><td>78</td></tr>
<tr><td>556</td><td>even</td><td>off</td><td>off</td><td>60</td></tr>
<tr><td>556</td><td>even</td><td>off</td><td>on</td><td>68</td></tr>
<tr><td>800</td><td>odd</td><td>on</td><td>off</td><td>90</td></tr>
<tr><td>800</td><td>odd</td><td>off</td><td>off</td><td>B0</td></tr>
<tr><td>800</td><td>odd</td><td>off§</td><td>on</td><td>B8</td></tr>
<tr><td>800</td><td>even</td><td>off</td><td>off</td><td>A0</td></tr>
<tr><td>800</td><td>even</td><td>off</td><td>on</td><td>A8</td></tr>
<tr><td>800</td><td colspan="3">single-density 9-track tapes only</td><td>C0</td></tr>
<tr><td>1600</td><td colspan="3">dual-density 9-track tapes only</td><td>C0</td></tr>
<tr><td>800</td><td colspan="3">dual-density 9-track tapes only</td><td>C8</td></tr>
</table></td></tr>
<tr><td>Ⓑ</td><td>blank</td><td>End-of-block. Ⓑ is alter code 5.</td></tr>
<tr><td>Ⓒ</td><td>blank</td><td>Cancel 1052 response. Ⓒis alter code 0.</td></tr>
<tr><td>DEL</td><td>X'cuu'</td><td>cuu = unit number of device to be deleted.</td></tr>
<tr><td>SET</td><td>[DATE=value1][,CLOCK=value2]</td><td>value1: in one of the following formats

mm/dd/yy or dd/mm/yy

mm: month (01 - 12)
dd: day (01 - 31)
yy: year (00 - 99)

value2: in the following format

hh/mm/ss

hh: hours (00 - 23)
mm: minutes (00 - 59)
ss: seconds (00 - 59)</td></tr>
</table>

● Appendix C: Part I (2 of 2)

Part II: Job Control Commands (Issued only between Jobs or Job Steps)

<table>
<tr><th>Operation</th><th>Operand</th><th>Remarks</th></tr>
<tr><td>ALLOC</td><td>{F1=nK [,F2=nK]
{F2=nK [,F1=nK]</td><td>Allocates foreground program areas.
Value of n must be even</td></tr>
<tr><td>ASSGN</td><td>SYSxxx,address [{,X'ss'
{,ALT] [,TEMP]</td><td>SYSxxx: can be SYSRDR
SYSIPT
SYSIN
SYSLST
SYSPCH
SYSOUT
SYSLOG
SYSLNK
SYS000 - SYS244

address: can be X'cuu', UA, or IGN

X'cuu': c=0-6
uu=00-FE(0-254) in hex

UA: unassign

IGN: unassign and ignore

X'ss': Device specifications (used to specify mode settings for 7-track and 9-track tapes). If X'ss' is not specified, the mode settings remain unchanged. The LISTIO command may be used to determine the current mode settings for all magnetic tape units.

<table>
<tr><th>ss</th><th>Bytes per Inch</th><th>Parity</th><th>Translate Feature</th><th>Convert Feature</th></tr>
<tr><td>10</td><td>200</td><td>odd</td><td>off</td><td>on</td></tr>
<tr><td>20</td><td>200</td><td>even</td><td>off</td><td>off</td></tr>
<tr><td>28</td><td>200</td><td>even</td><td>on</td><td>off</td></tr>
<tr><td>30</td><td>200</td><td>odd</td><td>off</td><td>off</td></tr>
<tr><td>38</td><td>200</td><td>odd</td><td>on</td><td>off</td></tr>
<tr><td>50</td><td>556</td><td>odd</td><td>off</td><td>on</td></tr>
<tr><td>60</td><td>556</td><td>even</td><td>off</td><td>off</td></tr>
<tr><td>68</td><td>556</td><td>even</td><td>on</td><td>off</td></tr>
<tr><td>70</td><td>556</td><td>odd</td><td>off</td><td>off</td></tr>
<tr><td>78</td><td>556</td><td>odd</td><td>on</td><td>off</td></tr>
<tr><td>90</td><td>800</td><td>odd</td><td>off</td><td>on</td></tr>
<tr><td>A0</td><td>800</td><td>even</td><td>off</td><td>off</td></tr>
<tr><td>A8</td><td>800</td><td>even</td><td>on</td><td>off</td></tr>
<tr><td>B0</td><td>800</td><td>odd</td><td>off</td><td>off</td></tr>
<tr><td>B8</td><td>800</td><td>odd</td><td>on</td><td>off</td></tr>
<tr><td>C0</td><td>{800
{1600</td><td colspan="3">single-density 9-track tapes only
dual-density 9-track tapes only</td></tr>
<tr><td>C8</td><td>800</td><td colspan="3">dual-density 9-track tapes only</td></tr>
</table>

ALT: specifies alternate unit
Not valid for any system input file or SYSLNK or SYSLOG.

TEMP: specifies a temporary assignment for background programs only</td></tr>
<tr><td>Ⓑ</td><td>blank</td><td>End-of-block. Ⓑ is alter code 5</td></tr>
<tr><td>Ⓒ</td><td>blank</td><td>Cancel 1052 response. Ⓒ is alter code 0.</td></tr>
</table>

ppendix C: Part II (1 of 3)

Operation	Operand	Remarks
CANCEL	[{blank / BG}] [F1] [F2]	{blank / BG} cancels background program F1, F2 cancels specified program
CLOSE	SYSxxx [,X'cuu' [,X'ss'] / ,UA / ,IGN / ,ALT]	SYSxxx: for 2311 - SYSIN, SYSRDR, SYSIPT, SYSPCH, SYSLST for magnetic tape - SYSPCH, SYSLST, SYSOUT, SYS000 - SYS244 X'cuu', X'ss', UA, IGN, ALT: values as described in ASSGN command
DVCDN	X'cuu'	X'cuu': c = 0 - 6 uu = 00 - FE (0 - 254) in hex
DVCUP	X'cuu'	X'cuu': c = 0 - 6 uu = 00 - FE (0 - 254) in hex
HOLD	{F1 [,F2] / F2 [,F1]}	Holds all I/O assignments for the specified foreground area(s) from one job to the next
LISTIO	SYS, PROG, F1, F2, ALL, SYSxxx, UNITS, DOWN, UA, X'cuu'	Causes listing of specified I/O assignments
LOG	blank	Causes logging of job control statements
MAP	blank	Causes a map of areas in main storage to be printed on SYSLOG
MTC	opcode, {X'cuu' / SYSxxx} [,nn]	opcode: BSF, BSR, ERG, FSF, FSR, RUN, REW, or WTM X'cuu': c = 0 - 6 uu = 00 - FE (0 - 254) in hex SYSxxx: any logical unit nn: decimal number (01 - 99)
NOLOG	blank	Suppresses logging of job control statements and foreground initiation commands
PAUSE	any user comment	Causes pause at end of current job step
RELSE	{F1 [,F2] / F2 [,F1]}	Release all I/O assignments for the specified foreground area(s) and set them to unassigned at the completion of any job specified for that area.

● Appendix C: Part II (2 of 3)

Operation	Operand	Remarks
RESET	{ SYS / PROG / ALL / SYSxxx }	Resets I/O assignments to system standard
SET	[DATE=value1] [,CLOCK=value2] [,UPSI=value3] [,LINECT=value4] [,RCLST=value5] [,RCPCH=value6]	value1: in one of the following formats mm/dd/yy or dd/mm/yy mm: month (01-12) dd: day (01-31) yy: year (00-99) value2: in the following format hh/mm/ss hh: hours (00-23) mm: minutes (00-59) ss: seconds (00-59) value3: 0, 1, or X value4: standard number of lines for output on each page of SYSLST value5: decimal number indicating minimum number of SYSLST disk records remaining to be written before operation warning value6: decimal number indicating minimum number of SYSPCH disk records remaining to be written before operator warning
STOP	blank	Stops background program processing.
UCS	SYSxxx,phasename [,FOLD] [,BLOCK] [,NULMSG]	SYSxxx: The name of the logical unit assigned to a 1403 UCS Printer phasename: The symbolic name of the core image library containing the 240 EBCDIC characters to be loaded followed by an 80-character verification message. FOLD: Signifies that the buffer is to be loaded with the folding operation code in the CCW. BLOCK: Signifies that the 2821 latch is to be set to inhibit data checks generated by the 1403 UCS Printer. NULMSG: Signifies that the 80-character verification message is not to be printed on the 1403 after the buffer is loaded.
UNA	{ F1 [,F2] / F2 [,F1] }	Unassigns the specified foreground area(s) I/O assignments.

Appendix C: Part II (3 of 3)

Part III: ATTN Commands (Issued at any time)

Operation	Operand	Remarks
ALLOC	{F1=nK [,F2=nK] F2=nK [,F1=nK]}	Allocates foreground program areas Value of n is an even number
Ⓑ	blank	End-of-block. Ⓑ is alter code 5.
Ⓒ	blank	Cancel 1052 response. Ⓒ is alter code 0.
CANCEL	{BG F1 F2}	Cancels execution of current job in specified area
LOG	blank	Causes logging of job control statements on SYSLOG
MAP	blank	Causes a map of areas in main storage to be printed on SYSLOG
MSG	{F1 F2}	Transfers control to foreground program message routine
NOLOG	blank	Suppresses logging of job control statements on SYSLOG
PAUSE	[any operator comments]	Causes pause at end of current job step
START	{BG F1 F2}	Initiates a background or foreground program
TIMER	{BG F1 F2}	Causes interval timer support to be given to the specified program

Appendix C: Part III

Part IV: Foreground Initiation Commands (Issued only after START command)

<table>
<tr><th>Operation</th><th>Operand</th><th>Remarks</th></tr>
<tr><td>ASSGN</td><td>SYSnnn,address [{,X'ss'
,ALT}]</td><td>SYSnnn: can be SYS000,SYS001,...

address: can be X'cuu' or IGN

X'cuu': c = 0-6
uu = 00-FE (0-254) in hex

IGN: unassign and ignore

X'ss': used for magnetic tape only

<table>
<tr><th>ss</th><th>Bytes per Inch</th><th>Parity</th><th>Translate Feature</th><th>Convert Feature</th></tr>
<tr><td>10</td><td>200</td><td>odd</td><td>off</td><td>on</td></tr>
<tr><td>20</td><td>200</td><td>even</td><td>off</td><td>off</td></tr>
<tr><td>28</td><td>200</td><td>even</td><td>on</td><td>off</td></tr>
<tr><td>30</td><td>200</td><td>odd</td><td>off</td><td>off</td></tr>
<tr><td>38</td><td>200</td><td>odd</td><td>on</td><td>off</td></tr>
<tr><td>50</td><td>556</td><td>odd</td><td>off</td><td>on</td></tr>
<tr><td>60</td><td>556</td><td>even</td><td>off</td><td>off</td></tr>
<tr><td>68</td><td>556</td><td>even</td><td>on</td><td>off</td></tr>
<tr><td>70</td><td>556</td><td>odd</td><td>off</td><td>off</td></tr>
<tr><td>78</td><td>556</td><td>odd</td><td>on</td><td>off</td></tr>
<tr><td>90</td><td>800</td><td>odd</td><td>off</td><td>on</td></tr>
<tr><td>A0</td><td>800</td><td>even</td><td>off</td><td>off</td></tr>
<tr><td>A8</td><td>800</td><td>even</td><td>on</td><td>off</td></tr>
<tr><td>B0</td><td>800</td><td>odd</td><td>off</td><td>off</td></tr>
<tr><td>B8</td><td>800</td><td>odd</td><td>on</td><td>off</td></tr>
<tr><td>C0</td><td>{800
1600}</td><td colspan="3">single-density 9-track tapes only
dual-density 9-track tapes only</td></tr>
<tr><td>C8</td><td>800</td><td colspan="3">dual-density 9-track tapes only</td></tr>
</table>

ALT: specifies alternate unit</td></tr>
<tr><td>Ⓑ</td><td>blank</td><td>End-of-block. Ⓑ is alter code 5</td></tr>
<tr><td>Ⓒ</td><td>blank</td><td>Cancel 1052 response. Ⓒ is alter code 0.</td></tr>
<tr><td>CANCEL</td><td>blank
{BG
F1
F2}</td><td>blank cancels initiation of foreground program
BG, F1, F2 cancel specified program</td></tr>
<tr><td>DLAB</td><td>'label fields 1-3'
xxxx,yyddd,yyddd,'system code'
[,type]</td><td>'label fields 1-3': first three fields of Format 1 DASD file label. Is a 51-byte character string, contained within apostrophes and followed by a comma. Entire 51-byte field must be contained in the first of the two commands. A continuation character is in column 72. Field 1 is the file name (44-byte alphameric); field 2 is the format identifier (1-byte numeric); field 3 is the file serial number (6-byte alphameric).

xxxx: volume sequence number (4-digit numeric). Must begin in column 16 of the continuation command. Columns 1-15 are blank.

yyddd,yyddd: file creation date followed by file expiration date. Each is 5-digit numeric.</td></tr>
</table>

Appendix C: Part IV (1 of 3)

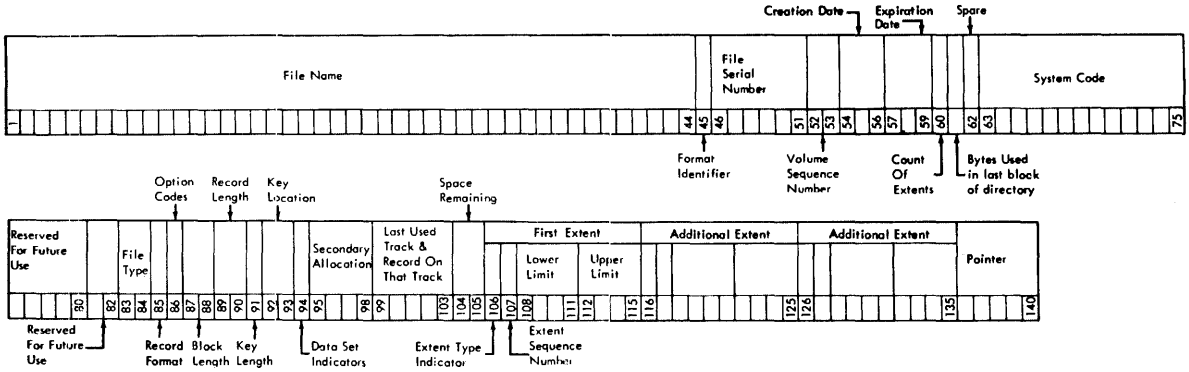
Operation	Operand	Remarks
DLAB		'system code': not required. When used, a 13-character string, within apostrophes. type: SD, DA, ISC, or ISE. If omitted, SD is assumed.
EXEC	progname	progname: one to eight alphabetic characters.
HOLD	{F1 [,F2]} {F2 [,F1]}	Holds all I/O assignments for the specified foreground area (s) from one job to the next.
LISTIO	{BG F1 F2 UA ALL}	Causes listing of specified I/O assignments.
LOG	blank	Causes logging of foreground initiation commands on SYSLOG.
NOLOG	blank	Suppresses logging of foreground initiation commands on SYSLOG.
READ	X'cuu'	X'cuu': c = 0-6 uu = 00-FE (0-254) in hex Note: Device must be a card reader
RELSE	{F1 [,F2]} {F2 [,F1]}	Release all I/O assignments for the specified foreground area (s) and set them to unassigned at the completion of any job specified for that area.
TPLAB	'label fields 3-10' 'label fields 3-10'	'label fields 3-10': indicated fields of the standard type file label. A 59-byte character string, contained with apostrophes. label fields 11-13': 20-character direct continuation of the same character string begun with fields 3-10 (no blanks, apostrophes, or commas separating). A continuation character must be present in column 72.
UCS	SYSxxx,phasename[,FOLD] [,BLOCK] [,NULMSG]	SYSxxx: The name of the logical unit assigned to a 1403 UCS Printer phasename: The symbolic name of the core image library containing the 240 EBCDIC characters to be loaded followed by an 80-character verification message. FOLD: Signifies that the buffer is to be loaded with the folding operation code in the CCW. BLOCK: Signifies that the 2821 latch is to be set to inhibit data checks generated by the 1403 UCS Printer. NULMSG: Signifies that the 8--character verification message is not to be printed on the 1403 after the buffer is loaded.
UNA	{F1 [,F2]} {F2 [,F1]}	Unassigns the specified foreground area (s) I/O assignments.

● Appendix C: Part IV (2 of 3)

Operation	Operand	Remarks
VOL	SYSnnn,filename	SYSnnn: can be SYS000,SYS001,... filename: one to eight alphabetic characters
XTENT	type,sequence,lower,upper, 'serial no.',SYSxxx [,B_2]	type: 1 for data area (no split cyclinder) 2 for overflow area (for indexed sequential file) 4 for index area (for indexed sequential file) 128 for data area (split cylinder) sequence: sequence number of extent within multi-extent file. Can be 0-255. lower: lower limit of extent in the form $B_1C_1C_1C_2C_2C_2H_1H_2H_2$ where: B_1 = 0 for 2311; 0-9 for 2321 C_1C_1 = 00 for 2311; 00-09 for 2321 $C_2C_2C_2$ = 000-199 for 2321; 000-009 for 2321 H_1 = 0 for 2311; 0-4 for 2321 H_2H_2 = 00-09 for 2311; 00-19 for 2321 upper: upper limit of extent in the same form as for lower limit. Note: The last 4 strips of sub cell 19 are reserved for alternate tracks on 2311 Data Cell. 'serial no.': 6-alphameric-character volume serial number contained within apostrophes SYSxxx: can be SYS000-SYS244 B_2: 0 for 2311; 0-9 for 2321

Appendix C: Part IV (3 of 3)

APPENDIX D: STANDARD DASD FILE LABELS



Format 1: This format is common to all data files on disk.

FIELD	NAME AND LENGTH	DESCRIPTION
1.	FILE NAME 44 bytes, alphameric EBCDIC	This field serves as the key portion of the file label. It can consist of three sections: 1. File ID is an alphameric assigned by the user and identifies the file. Can be 1-35 bytes if generation and version numbers are used, or 1-44 bytes if they are not used. 2. Generation Number. If used, this field is separated from File ID by a period. It has the format Gnnnn, where G identifies the field as the generation number and nnnn (in decimal) identifies the generation of the file. 3. Version Number of Generation. If used, this section immediately follows the generation number and has the format Vnn, where V identifies the field as the version of generation number and nn (in decimal) identifies the version of generation of the file. Note: Disk Operating System compares the entire field against the file name given in the DLAB card. The generation and version numbers are treated differently by Operating System.

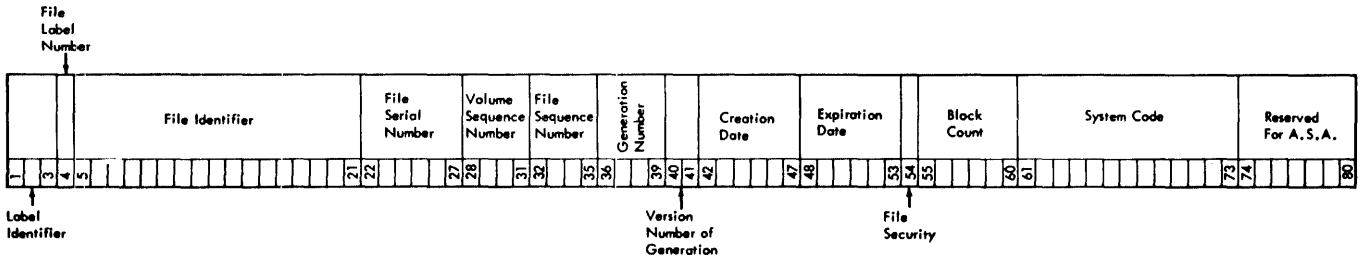
The remaining fields comprise the DATA portion of the file label:

FIELD	NAME AND LENGTH	DESCRIPTION
2.	FORMAT IDENTIFIER 1 byte, EBCDIC numeric	1 = Format 1
3.	FILE SERIAL NUMBER 6 bytes, alphameric EBCDIC	Uniquely identifies a file/volume relationship. It is identical to the Volume Serial Number of the first or only volume of a multi-volume file.
4	VOLUME SEQUENCE NUMBER 2 bytes, binary	Indicates the order of a volume relative to the first volume on which the data file resides.
5	CREATION DATE 3 bytes, discontinuous binary	Indicates the year and the day of the year the file was created. It is of the form YDD, where Y signifies the year (0-99) and DD the day of the year (1-366).
6	EXPIRATION DATE 3 bytes, discontinuous binary	Indicates the year and the day of the year the file may be deleted. The form of this field is identical to that of Field 5.
7A	EXTENT COUNT 1 byte, binary	Contains a count of the number of extents for this file on this volume. If user labels are used, the count includes the user label track as a separate extent. This field is maintained by the Disk Operating System programs.
7	BYTES USED IN LAST BLOCK OF DIRECTORY 1 byte, binary	Used by Operating System only for partioned (library structure) data sets. Not used by Disk Operating System.
7C	SPARE 1 byte	Reserved for future use.
8	SYSTEM CODE 13 bytes	Uniquely identifies the programming system.
9	RESERVED 7 bytes	This field is reserved for future use.
10	FILE TYPE 2 bytes	The contents of this field uniquely identify the type of data file: Hex 4000 = Consecutive organization Hex 2000 = Direct-access organization Hex 8000 = Indexed-sequential organization Hex 0200 = Library organization Hex 0000 = Organization not defined in the file label.
11	RECORD FORMAT 1 byte	The contents of this field indicate the type of records contained in the file:

Bit Position	Content	Meaning
0 and 1	01	Variable-length records
	10	Fixed-length records
	11	Undefined format
2	0	No track overflow
	1	File is organized using track overflow (Operating System/360 only)
3	0	Unblocked records
	1	Blocked records

FIELD	NAME AND LENGTH	DESCRIPTION
		Bit Position / Content / Meaning
		4 / 0 / No truncated records
		1 / Truncated records in file
		5 and 6 / 01 / Control character ASA code
		10 / Control Character machine code
		00 / Control Character not stated
		7 / 0 / Records have no keys
		1 / Records are written with keys.
12	OPTION CODES 1 byte	Bits within this field are used to indicate various options used in building the file. BIT 0 = If on, indicates data file was created using Write Validity Check. 1-7 = unused
13.	BLOCK LENGTH 2 bytes, binary	indicates the block length for fixed length records or maximum block size for variable length blocks.
14.	RECORD LENGTH 2 bytes, binary	indicates the record length for fixed length records or the maximum record length for variable length records.
15.	KEY LENGTH 1 byte, binary	indicates the length of the key portion of the data records in the file.
16.	KEY LOCATION 2 bytes, binary	indicates the high order position of the data record.
17.	DATA SET INDICATORS 1 byte	Bits within this field are used to indicate the following: BIT 0 If on, indicates that this is the last volume on which this file normally resides. This bit is used by the Disk Operating System DTFSR routine only. None of the other bits in this byte are used by Disk Operating System. 1 If on, indicates that the data set described by this file must remain in the same absolute location on the direct access device. 2 If on, indicates that Block Length must always be a multiple of 8 bytes. 3 If on, indicates that this data file is security protected; a password must be provided in order to access it. 4-7 Spare. Reserved for future use.
18.	SECONDARY ALLOCATION 4 bytes, binary	indicates the amount of storage to be requested for this data file at End of Extent. This field is used by Operating System only. It is not used by Disk Operating System routines. The first byte of this field is an indication of the type of allocation request. Hex code "C2" (EBCDIC "B") indicates bytes, hex code "E3" (EBCDIC "T") indicates tracks, and hex code "C3" (EBCDIC "C") indicates cylinders. The next three bytes of this field is a binary number indicating how many bytes, tracks or cylinders are requested.
19.	LAST USED TRACK AND RECORD ON THAT TRACK 5 bytes discontinuous binary	indicates the last occupied track in a consecutive file organization data file. This field has the format CCHHR. It is all binary zeros if the last track in a consecutive data file is not on this volume or if it is not consecutive organization.
20	AMOUNT OF SPACE REMAINING ON LAST TRACK USED 2 bytes, binary	A count of the number of bytes of available space remaining on the last track used by this data file on this volume.
21.	EXTENT TYPE INDICATOR 1 byte	indicates the type of extent with which the following fields are associated: HEX CODE 00 Next three fields do not indicate any extent. 01 Prime area (Indexed Sequential); or Consecutive area, etc., (i.e., the extent containing the user's data records.) 02 Overflow area of an Indexed Sequential file. 04 Cylinder index or master index area of an Indexed Sequential file. 40 User label track area 80 Shared cylinder indicator.
22.	EXTENT SEQUENCE NUMBER 1 byte, binary	indicates the extent sequence in a multi-extent file.
23.	LOWER LIMIT 4 bytes, discontinuous binary	the cylinder and the track address specifying the starting point (lower limit) of this extent component. This field has the format CCHH.
24	UPPER LIMIT 4 bytes	the cylinder and the track address specifying the ending point (upper limit) of this extent component. This field has the format CCHH.
25-28	ADDITIONAL EXTENT 10 bytes	These fields have the same format as the fields 21-24 above.
29-32	ADDITIONAL EXTENT 10 bytes	These fields have the same format as fields 21-24 above.
33	POINTER TO NEXT FILE LABEL WITHIN THIS LABEL SET 5 bytes, discontinuous binary	the disk address (format CCHHR) of a continuation label if needed to further describe the file. If field 9 indicates Indexed Sequential organization, this field will point to a Format 2 file label within this label set. Otherwise, it points to a Format 3 file label, and then only if the file contains more than three extent segments. This field contains all binary zeros if no additional file label is pointed to.

APPENDIX E: STANDARD TAPE FILE LABELS



The standard tape file label format and contents are as follows:

FIELD	NAME AND LENGTH	DESCRIPTION
1.	LABEL IDENTIFIER 3 bytes, EBCDIC	identifies the type of label HDR = Header -- beginning of a data file EOF = End of File -- end of a set of data EOV = End of Volume -- end of the physical reel
2.	FILE LABEL NUMBER 1 byte, EBCDIC	Always a 1
3.	FILE IDENTIFIER 17 bytes, EBCDIC	uniquely identifies the entire file, may contain only printable characters.
4.	FILE SERIAL NUMBER 6 bytes, EBCDIC	uniquely identifies a file/volume relationship. This field is identical to the Volume Serial Number in the volume label of the first or only volume of a multi-volume file or a multi-file set. This field will normally be numeric (000001 to 999999) but may contain any six alphameric characters.
5.	VOLUME SEQUENCE NUMBER 4 bytes	indicates the order of a volume in a given file or multi-file set. The first must be numbered 0001 and subsequent numbers must be in proper numeric sequence.
6.	FILE SEQUENCE NUMBER 4 bytes	assigns numeric sequence to a file within a multi-file set. The first must be numbered 0001.
7.	GENERATION NUMBER 4 bytes	uniquely identifies the various editions of the file. May be from 0001 to 9999 in proper numeric sequence.
8.	VERSION NUMBER OF GENERATION 2 bytes	indicates the version of a generation of a file.
9.	CREATION DATE 6 bytes	indicates the year and the day of the year that the file was created: Position / Code / Meaning 1 / blank / none 2-3 / 00-99 / Year 4-6 / 001-366 / Day of Year (e.g., January 31, 1965 would be entered as 65031)
10.	EXPIRATION DATE 6 bytes	indicates the year and the day of the year when the file may become a scratch tape. The format of this field is identical to Field 9. On a multifile reel, processed sequentially, all files are considered to expire on the same day.
11.	FILE SECURITY 1 byte	indicates security status of the file. 0 = no security protection 1 = security protection. Additional identification of the file is required before it can be processed.
12.	BLOCK COUNT 6 bytes	indicates the number of data blocks written on the file from the last header label to the first trailer label exclusive of tape marks. Count does not include checkpoint records. This field is used in Trailer Labels.
13.	SYSTEM CODE 13 bytes	uniquely identifies the programming system.
14.	RESERVED 7 bytes	Reserved for American Standards Association (A.S.A.). At present, should be recorded as blanks.

DEVICE: 2400-SERIES MAGNETIC TAPE UNITS

CSW Bit 44 -- Channel Data Check

Initial Selection--eight retries without repositioning.

Read Data Transfer--no retries.

Write Data Transfer--eight retries with repositioning.

After stated number of retries, take equipment error exit (cancel).

Message: 0P28 CHAN DTCHK

CSW Bit 47 -- Chaining Check

Allow eight retries with repositioning, and then take equipment error exit (cancel).

Message: 0P14 OVERRUN

Byte 0, Bit 0 -- Command Reject

Take program check exit.

Message: 3P18 COMM REJCT

Byte 0, Bit 1 -- Intervention Required

Check for rewind and unload (intervention required at device end); if yes, take continue exit; otherwise, take operator intervention exit.

Message: 0P08 INTERV REQ

Byte 0, Bit 2 -- Bus Out Check

If retry count is greater than seven, take equipment error exit (cancel). If initial selection, take retry exit. Otherwise, perform repositioning and take retry exit.

Message: 0P09 BUSOUT CHK

Byte 0, Bit 3 -- Equipment Check

Take equipment error exit (cancel).

Message: 0P10 EQUIP CHK

Byte 0, Bit 4 -- Data Check

Read Commands--CCB option. If the record length is less than twelve and byte 1, bit 0 (noise) is off, take retry exit. Otherwise, retry 100 times with repositioning (backspace/forward space) performing CRC correction. Perform tape cleaning every eight retries. Tape cleaning consists of five/four backspaces and four/five forward spaces. Detection of load point terminates the backspacing sequence. After 100 retries, take equipment error exit (cancel, ignore).

Write and WTM Commands--Backspace erase and retry fifteen times, then take equipment error exit (cancel). For write commands, if unit exception is present in CSW, post it to the CCB (byte 4, Bit 7).

Erase Gap Commands--after 15 retries without repositioning take equipment error exit (cancel).

Message: 0P11 DATA CHECK

Byte 0, Bit 5 -- Overrun

Allow eight retries with repositioning and then take equipment error exit (cancel).

Message: 0P14 OVERRUN

Byte 0, Bit 7 -- Data Converter Check

Take equipment error exit (cancel).

Message: 0P30 CONVRT CHK

Byte 1, Bit 4 -- Load Point and Byte 3, Bit 6 -- Backward Status

Take program check exit.

Message: 0P29 BK INTO LP (backward command into load point)

Byte 1, Bit 7 -- Not Capable

Issue a rewind and unload command to the unit and then take operator intervention exit.

Message: 0P32 NOT COMPAT

Note: If an I/O error occurs during tape repositioning (other than backspace into load point on tape cleaning), the equipment error exit (cancel) is taken with the message: 0P20 ERR ON REC (error on recovery).

Note: To achieve Data Check error recovery on write tapemark and erase gap commands, they must be command chained to a No-op, otherwise the command code is not available for analysis when the error occurs (device end).

DEVICE: 1052

CSW Bit 44 -- Channel Data Check

Allow one retry and then take equipment error exit (cancel, retry, ignore).

Message: 0P28 CHAN DTCHK

Byte 0, Bit 0 -- Command Reject

Take program check exit.

Message: 0P18 COMM REJCT

Byte 0, Bit 1 -- Intervention Required

Execute audible alarm command and take operator intervention exit.

Message: 0P08 INTERV REQ

Byte 0, Bit 2 -- Bus Out Check

Allow one retry and then take equipment error exit (cancel, retry, ignore).

Message: 0P09 BUSOUT CHK

Byte 0, Bit 3 -- Equipment Check

Allow one retry on write and no retries on read. Take the equipment error exit (cancel, retry, ignore).

Message: 0P10 EQUIP CHK

DEVICE: 1403-1443

CSW Bit 44 -- Channel Data Check

If initial selection, allow one retry and then take equipment error exit (cancel, retry). If channel end; cancel, retry, or ignore.

Message: 0P28 CHAN DTCHK

Byte 0, Bit 0 -- Command Reject

If command code is UCS enable or inhibit data check, take continue exit. Otherwise, take program check exit. This allows UCS-oriented programs to operate on non-UCS equipment.

Message: 0P18 COMM REJCT

Byte 0, Bit 1 -- Intervention Required

Take operator intervention exit.

Message: 0P08 INTERV REQ

Byte 0, Bit 2 -- Bus Out Check

If initial selection, allow one retry and then take exit (cancel, retry). Otherwise, take equipment error exit. For channel end; take error exit (cancel, retry, or ignore).

Message: 0P09 BUSOUT CHK

Byte 0, Bit 3 -- Equipment Check

Take equipment error exit (cancel, ignore).

Message: 0P10 EQUIP CHK

Byte 0, Bit 4 -- Data Check (1403 only)

Take equipment error exit (cancel, ignore).

Message: 0P11 DATA CHECK

Byte 0, Bit 5 -- Code General Storage Parity Error (1403 only)

If channel end, perform one retry and then take equipment error exit (cancel). UCS buffer must be reloaded.

Message: 0P33 UCB PARITY

Byte 0, Bit 7 -- Channel 9

Post CCB and take continue exit. This test is core resident.

DEVICE: 1442

CSW Bit 44 -- Channel Data Check

If initial selection, allow one retry and take equipment error exit (cancel, retry). If data transfer, take operator intervention required exit.

Message: 0P28 CHAN DTCHK

CSW Bit 47 -- Chaining Check

Take operator intervention exit.

Message: 0P14 OVERRUN

Byte 0, Bit 0 -- Command Reject

Take program check exit.

Message: 0P18 COMM REJCT

Byte 0, Bit 1 -- Intervention Required

Take operator intervention exit.

Message: 0P08 INTERV REQ

Byte 0, Bit 2 -- Bus Out Check

If initial selection, do one retry and then take equipment error exit (cancel, retry). If data transfer, take operator intervention required exit.

Message: 0P09 BUSOUT CHK

Byte 0, Bit 3 -- Equipment Check

Take operator intervention exit.

Message: 0P10 EQUIP CHK

Byte 0, Bit 4 -- Data Check

Take operator intervention exit.

Message: 0P11 DATA CHECK

Byte 0, Bit 5 -- Overrun

Take operator intervention exit.

Message: 0P14 OVERRUN

DEVICE: 2321 DASD

CSW Bit 44 -- Channel Data Check

Allow one retry and then take equipment error exit (cancel, retry).

Message: 0P28 CHAN DTCHK

Byte 0, Bit 0 -- Command Reject

Check for byte 1, bit 5 (file protect) and take program check exit.

Messages: 0P17 FILE PROT
(command reject for file protect).
0P18 COMM REJCT
(command reject alone).

Byte 0, Bit 1 -- Intervention Required

Take operator intervention exit.

Message: 0P08 INTERV REQ

Byte 0, Bit 2 -- Bus Out Check

Allow 15 retries and then take equipment error exit (cancel, retry).

Message: 0P09 BUSOUT CHK

Byte 0, Bit 3 -- Equipment Check

Take equipment error exit (cancel, retry).

Message: 0P10 EQUIP CHK

Byte 0, Bit 4 -- Data Check

If retry count is less than eight, do number 2.
If retry count is equal to 226, take equipment error exit (cancel, retry).
If retry count is an even number, issue a seek to X-X-X-4-19 (last track of strip) and a seek to X-X-X-0-0 (first track of strip). Repeat operation eight times, then do number 1 following.

1. If retry count is any multiple of 32 (32, 64, 96, ...), issue a seek to next lower strip. If this is the lowest strip (00000), seek the next highest strip and do number 2 following.
2. Increment retry count and take exit (retry).

Messages: 0P12 VERIFY CHK (Data check on verify command).
0P16 DTA CHK CT (Data check on count).

Byte 0, Bit 5 -- Overrun

Take retry exit fifteen times and then take equipment error exit (cancel, retry).

Message: 0P14 OVERRUN

Byte 0, Bit 7 -- Seek Check

If byte 0, bit 0 is present, take program check exit. If byte 1, bit 6 is present, tape operator intervention exit. Otherwise, issue a seek to BB1111 and BB2222 and take retry exit. After ten retries, take equipment error exit (cancel, retry).

Messages: 0P26 INVAL SEEK (Seek check/command reject).
0P22 BALST CELL (Seek check/missing address markers).
0P15 SEEK CHECK (Seek check alone).

Byte 1, Bit 4 -- No Record Found

If byte 1, bit 6 is present and retry count is less than 3, issue a restore command, increment retry count, and take retry exit. Then do number 1 following.
If retry count is equal to three, issue a read home address to the first and last tracks of the cylinder. If neither is successful (unit check), take equipment error exit (cancel, retry). Otherwise, increment retry count and take retry exit. Then do number 1 following.

1. Issue a read home address and compare CCH to user's seek address. If equal, post no record found to CCB and take continue exit. Otherwise, go to routine for seek check alone.

Messages: 0P15 SEEK CHECK (No record found/home address unequal to seek address).
0P23 BLNK STRIP (cannot read home address).
0P21 NRF-MADDMK (15 retries).

Byte 1, Bit 6 -- Missing Address Markers

Perform action indicated under data check.

Message: 0P13 ADDR MRKER

DEVICE: 2501, 2520, 2540

CSW Bit 44 -- Channel Data Check

If initial selection, allow one retry and then take equipment error exit (cancel, retry).
If READ data transfer, take operator intervention exit.
If PUNCH data transfer, allow one retry and then take equipment error exit (cancel, retry).

Message: 0P28 CHAN DTCHK

CSW Bit 47 -- Chaining Check (2501, 2520 read, only)

Take operator intervention exit.

Message: 0P14 OVERRUN

Byte 0, Bit 0 -- Command Reject

Take program check exit.

Message: 0P18 COMM REJCT

Byte 0, Bit 1 -- Intervention Required

Take operator intervention exit.

Message: 0P08 INTERV REQ

Byte 0, Bit 2 -- Bus Out Check

Allow one retry and then take equipment error exit (cancel, retry). For 2520, do not retry if not the initial selection but take error exit (cancel, retry).

Message: 0P09 BUSOUT CHK

Byte 0, Bit 3 -- Equipment Check

If reader, take operator intervention exit.
If punch, CCB option. Take equipment error exit (cancel, ignore).
For 2520, byte 0, bit 7 indicates the punch check.

Message: 0P10 EQUIP CHK

Byte 0, Bit 4 -- Data Check (cannot occur on 2520 punch)

Take operator intervention exit.

Message: 0P11 DATA CHECK

Byte 0, Bit 5 -- Overrun (cannot occur on 2520 punch or 2540)

Take operator intervention exit.

Message: 0P14 OVERRUN

DEVICE: 2671

CSW Bit 44 -- Channel Data Check

If initial selection, do one retry and then take equipment error exit (cancel).

Message: 0P28 CHAN DTCHK

Byte 0, Bit 0 -- Command Reject

Take program check exit.

Message: 0P18 COMM REJCT

Byte 0, Bit 1 -- Intervention Required

Take operator intervention exit.

Message: 0P08 INTERV REQ

Byte 0, Bit 2 -- Bus Out Check

Do one retry, if error persists take equipment error exit (cancel, retry).

Message: 0P09 BUSOUT CHK

Byte 0, Bit 3 -- Equipment Check

Test CCB for IGNORE option (byte 2, bit 4). If ON, turn on byte 3, bit 1 of the CCB and take equipment error exit (cancel, ignore, retry). Otherwise, take operator intervention exit.

Message: 0P10 EQUIP CHK

Note

When an equipment check occurs, the operator must reposition the paper tape to the beginning of the record in error to perform the retry operation. The device must not be readied until this repositioning has been performed. If the IGNORE option is available to the operator, he can exercise this option by repositioning the tape to the beginning of the next record on the tape and then responding IGNORE on the 1052 printer-keyboard. The IGNORE option is available to the operator whenever the user specifies any of the DTFPT ERROPT entry options.

Byte 0, Bit 4 -- Data Check

Test CCB for IGNORE option (byte 2, bit 4). If ON, turn on byte 3, bit 3 of the CCB and take equipment error exit (cancel, retry, ignore). Otherwise, take operator intervention exit.

Message: 0P18 DATA CHECK

Note

When a data check occurs, the user's CCW is modified by the error routine to allow rereading of the last character. The data address will be the last character read (character in error) and the byte count is decreased by the number of valid characters read. If the CCB IGNORE option is chosen and the operator responds IGNORE, the I/O operation is dequeued and posted with the 'Disaster Error' bit ON (CCB byte 2, bit2) and 2671 Data Check bit ON (CCB byte 3, bit 3). To read the rest of the record, the problem program (logical IOCS) should add one to the CCW data address and subtract one from the byte count to adjust for not rereading the bad character, and then reissue the EXCP. The operator must backspace the tape two characters for retry (option retry or on the A-type message when ignore is not allowed). If the operator chooses the ignore option (the character in error is not to be reread), he must backspace the tape one character if the LOAD key was pressed to free the tape, or if the character preceding the character under the read head is an EDR. Otherwise, no manual intervention is required for the ignore option. The ignore option is available to the operator whenever the user specifies any of the DTFPT ERROPT entry options.

DEVICE: 2311 DASD

CSW Bit 44 -- Channel Data Check

Allow one retry and then take equipment error exit (cancel, retry).

Message: 0P28 CHAN DTCHK

CSW Bit 47 -- Chaining Check

If retry count is greater than ten, take equipment error exit (cancel, retry); otherwise, take retry exit.

Message: 0P14 OVERRUN

Byte 0, Bit 0 -- Command Reject

Check for byte 1, bit 5 (file protect) and then take program check exit.

Messages: 0P18 COMM REJCT
0P17 FILE PROT

Byte 0, Bit 1 -- Intervention Required

Take operator intervention exit.

Message: 0P08 INTERV REQ

Byte 0, Bit 2 -- Bus Out Check

If retry count is greater than ten, take equipment error exit (cancel, retry). Otherwise, take retry exit.

Message: 0P09 BUSOUT CHK

Byte 0, Bit 3 -- Equipment Check

Take equipment error exit (cancel, retry).

Message: 0P10 EQUIP CHK

Byte 0, Bit 4 -- Data Check*

CCB options (all data checks, data check on read or verify). If retry count is greater than ten, take equipment error exit (cancel, retry). Otherwise, take retry exit. After nine retries, post data check on count to CCB, if present. Otherwise, post data check to CCB. If command code is 'verify', post verify error to CCB.

Messages: 0P12 VERIFY CHK (data check on verify command).
0P11 DATA CHECK (data check/not data check on count or verify).
0P16 DTA CHK CT (data check on count).

Byte 0, Bit 5 -- Overrun

If retry count is greater than ten, take equipment error exit (cancel, retry); otherwise, take retry exit.

Messages: 0P14 OVERRUN

Byte 0, Bit 6 -- Track Condition Check

Read home address and R0 in error recovery routine and move CCHH from R0 to seek command executed below. If alternate track: update seek address to next track address. If track address equals ten, treat as end of cylinder; otherwise set up the channel program: seek read home address (with skip bit on), TIC to CSW address minus eight. Execute this channel program in error recovery. At channel end, exit to channel scheduler CSW processing routine. If DASD file proctected, set appropriate file mask following seek.

Byte 0, Bit 7 -- Seek Check

If byte 0, bit 0 (command reject) is ON, take program check exit. Otherwise, execute restore command and take retry exit. After ten retries, take equipment error exit (cancel, retry).

Message: 0P26 INVAL SEEK (seek check/command reject).
0P15 SEEK CHECK

Byte 1, Bit 1 -- Track Overrun

Post track overrun to the CCB and take continue exit.

Byte 1, Bit 2 -- End of Cylinder

Post end of cylinder to the CCB and take continue exit.

Byte 1, Bit 4 -- No Record Found*

Test for byte 1, bit 6 (missing address marker). If present, execute restore command and take retry exit. After ten retries, take equipment error exit (cancel, retry). If not present, read home address and compare to user's seek address. If equal, post no record found to the CCB and take continue exit. If not equal, treat as a seek check.

Message: 0P15 SEEK CHECK (home address unequal to seek address).
0P21 NRF-MADDMK (no record found/missing address marker)

Byte 1, Bit 5 -- File Prot

Take program check exit.

Message: 0P17 FILE PROT

Byte 1, Bit 6 -- Missing Address Markers*

If retry count is greater than ten, take equipment error exit (cancel, retry); otherwise, take retry exit.

Message: 0P13 ADDR MRKER

* For these errors, home address is read and the track address is provided for the error message. For other errors, the track address is obtained from the user seek address if error occurs during channel program execution.

Note

If the 2311 error routine gets an error while trying to execute a restore command or read home address or R0, the equipment error exit is taken with retry and cancel options.

Message: 0P20 ERR ON REC (error during recovery)/

```
CANCELV DISPLAY
VOLUME SERIAL NUMBER IS  111111                                                                                    11/04/66

00C7000001    FORMAT 4 LABEL

04040404   04040404   04040404   04040404   04040404   04040404   04040404   04040404   04040404   04040404   04040404   F4000000
0000009E   00000000   001E9001   000000CB   000A0E29   51141401   0219100A   00000000   00000000   00000000   00000000   00000000
00000000   00000000   00010000   C7000000   C7000400   00000000   00000000   00000000   00000000   00000000   00000000

00C7000002    FORMAT 5 LABEL

05050505   00000000   00000000   00000000   00000000   00000000   00000000   00000000   00000000   00000000   00000000   F5000000
00000000   00000000   00000000   00000000   00000000   00000000   00000000   00000000   00000000   00000000   00000000   00000000
00000000   00000000   00000000   00000000   00000000   00000000   00000000   00000000   00000000   00000000   00000000

00C7000003    FORMAT 1 LABEL

FILEA                                    SERIAL NO. 111111  VOL NO. 0001  420043-420043  010000  SYS. CODE IS  16 K DISK BOS
0000000000    0000400000    0000000000    0000000000    0000000000    0000000000
0100 00330000-006E0009    0000 00000000-00000000    0000 00000000-00000000                          POINTER IS  0000000000

00C7000004    FORMAT 1 LABEL

SYSTEM WORK FILE NO. 1                   SERIAL NO. 111111  VOL NO. 0001  42006E-63016D  010000  SYS. CODE IS  DOS
0000000000    0000400000    0000000000    0000008000    0000000000    0000000000
0100 00970000-009D0009    0000 00000000-00000000    0000 00000000-00000000                          POINTER IS  0000000000

00C7000005    FORMAT 1 LABEL

2311 DTFPH-SEQUENTIAL OPEN 'NO' USER LABELS.  SERIAL NO. 111111  VOL NO. 0001  41014D-42012C  030000  SYS. CODE IS  ** SIMONIK **
0000000000    0000400000    0000000000    0000000000    0000000000    0000000000
0100 00AF0000-00AF0002    0101 00AF0003-00AF0003    0102 00AF0004-00AF0004                          POINTER IS  0000000000

VTOC LISTING COMPLETED
```

```
DSPLYV DISPLAY
VOLUME SERIAL NO. IS 111111                                                  11/04/66

FILEA                                    1111111   0001   420043-420043
0100 00330000-006E0009

SYSTEM WORK FILE NO. 1                   1111111   0001   42006E-63016D
0100 00970000-009D0009

2311 DTFPH-SEQUENTIAL OPEN 'NO' USER LABELS. 1111111   0001   41014D-42012C
0100 00AF0000-00AF0002    0101 00AF0003-00AF0003    0102 00AF0004-00AF0004

VTOC LISTING COMPLETED
```

APPENDIX H: SEREP

SEREP (System Environment Recording, Editing, and Printing) is a program distributed as part of the diagnostic package for each System/360 installation. The program, with its operating procedures, is available to the installation's IBM Customer Engineer. (Each System/360 model has a different version of the SEREP program. Operating procedures, however, are the same for all versions.)

SEREP provides a means of printing the system status information stored in main storage at the time of a machine malfunction. When a condition occurs requiring the use of SEREP, the wait state is entered, and main storage byte 1 contains an S. The SEREP program must be loaded via the standard IPL procedure. Malfunction information is produced as output on an online printing device. The SEREP printout indicates the environment of the error and the device involved.

The address of the I/O device printed on the SEREP report is compared with the valid device addresses available to the system. The printing of a valid address indicates that a machine malfunction has occurred. The printing of an invalid device address indicates that a programming error has occurred. After SEREP is completed, the system is restarted via the IPL procedure.

International Business Machines Corporation
Data Processing Division
112 East Post Road, White Plains, N.Y. 10601
[USA Only]

IBM World Trade Corporation
821 United Nations Plaza, New York, New York 10017
[International]

READER'S COMMENT FORM

IBM System/360
Disk Operating System
Operating Guide

C24-5022-2

- Your comments, accompanied by answers to the following questions, help us produce better publications for your use. If your answer to a question is "No" or requires qualification, please explain in the space provided below. All comments will be handled on a non-confidential basis. Copies of this and other IBM publications can be obtained through IBM Branch Offices.

	Yes	No
• Does this publication meet your needs?	☐	☐
• Did you find the material:		
Easy to read and understand?	☐	☐
Organized for convenient use?	☐	☐
Complete?	☐	☐
Well illustrated?	☐	☐
Written for your technical level?	☐	☐

- What is your occupation? _____
- How do you use this publication?

As an introduction to the subject?	☐	As an instructor in a class?	☐
For advanced knowledge of the subject?	☐	As a student in a class?	☐
For information about operating procedures?	☐	As a reference manual?	☐

Other _____

- Please give specific page and line references with your comments when appropriate.

COMMENTS:

- Thank you for your cooperation. No postage necessary if mailed in the U. S. A.

Staple

24-5022-2

old Fold

FIRST CLASS
PERMIT NO. 170
ENDICOTT, N. Y.

BUSINESS REPLY MAIL
NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

POSTAGE WILL BE PAID BY . . .

IBM Corporation
P. O. Box 6
Endicott, N. Y. 13760

Attention: Programming Publications, Dept. 157

old Fold

Cut Along Line

IBM S/360 Printed in U. S. A. C24-5022-2

IBM

International Business Machines Corporation
Data Processing Division
112 East Post Road, White Plains, N.Y. 10601
[USA Only]

IBM World Trade Corporation
821 United Nations Plaza, New York, New York 10017
[International]

Additional Comments: