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Form C24-3392-3

IBM Systems Reference Library

IBM System/360 Basic Programming Support Operating Guide

Utility Programs

This reference publication contains the guidelines to operate the following utility programs:

Card to Disk	360P-UT-063
Card to Printer and/or Punch	360P-UT-050
Card to Tape	360P-UT-051
Disk to Card	360P-UT-064
Disk to Disk	360P-UT-067
Disk to Printer	360P-UT-073
Disk to Tape	360P-UT-065
Tape to Card	360P-UT-053
Tape to Disk	360P-UT-066
Tape to Printer	360P-UT-052
Tape to Tape	360P-UT-054
Alternate Track Assignment	360P-UT-098
Clear Disk	360P-UT-068
Initialize Disk	360P-UT-069
Initialize Tape	360P-UT-057
Multiple Utility	360P-UT-055
Storage Print	360P-UT-056

The above programs can be received by ordering individually numbered program packages.

The reader should be familiar with the IBM System/360 publications: IBM System/360 Basic Programming Support Specifications: Utility Programs, Form C24-3363; IBM System/360 Principles of Operation, Form A22-6821; and other manuals associated with his device configuration. For a list of related publications and their abstracts, see the IBM System/360 Bibliography, Form A22-6822.

Major Revision, September 1965

This edition, Form C24-3392-3, is a major revision of, and obsoletes, Form C24-3392-2. Changes are designated in three ways:

1. A vertical line appears at the left of the affected text where only a part of the page has been changed.

2. A dot (•) appears at the left or right of the page number where the complete page should be reviewed.

3. A dot (•) appears at the left of each figure that has been changed.

Pages that have been affected are: 1-3, 5, 13, 21, 23-26, 29-33, 35, 40, and 42.

Copies of this and other IBM publications can be obtained through IBM Branch Offices. A form has been provided at the back of this publication for readers' comments. If the form has been detached, comments may be directed to:

IBM Programming Publications, Endicott, New York 13764

CONTENTS

This publication provides the necessary reference information for the operator to run the utility programs. Detailed specifications can be found in the publications listed on the front cover.

The information is divided into two sections: Single Transfer Utility Programs and Special Utility Programs.

The Single Transfer Utility Programs section describes the file-to-file programs which transfer a single file at a time. It is organized in the manner in which utility operations are run. Information is complete from finding the correct object cards to the end-of-job message, including all diagnostic and physical error information. These programs are:

Card to Disk
Card to Printer and/or Punch
Card to Tape

Disk to Card
Disk to Disk
Disk to Printer
Disk to Tape

Tape to Card
Tape to Disk
Tape to Printer
Tape to Tape

The Special Utility Programs section describes those programs needed either to prepare a system for use, to provide multiple operations, or to be used as part of the diagnostic or physical error procedures. This section references the Single Transfer Utility Programs section for any of the common operating information. These programs are:

Alternate Track Assignment
Clear Disk
Initialize Disk
Initialize Tape
Multiple Utility
Storage Print

SINGLE TRANSFER UTILITY PROGRAMS

This section of the publication provides the reference information necessary to execute the eleven file-to-file object programs. For the convenience of the operator, each step is presented as a quick-reference chart. These sections and their descriptions are:

Program Object Deck Inserts (Figure 1) shows the placement of the object deck segments for program execution.

Program Deck Identification (Figure 2) gives the utility program identification number found in card columns 73-76 and the sequence number of the object decks in card columns 77-80.

Condensed Card Deck Components (Figure 3) gives the function of each object deck segment.

Respective Order of Control Cards (Figure 4) gives the order in which the user will supply the Job Control cards.

Operating Instructions for Running Object Programs (Figure 5) gives the device information necessary to execute the object deck.

Respective Order of Messages (Figure 6) gives the operator the list of codes and messages that should be anticipated while going through each segment of the program. Included with the list is a more specific reason for the code or message, and information regarding the response that should be taken for each one.

Physical Error Message Codes (Figure 7) gives the operator the interpretation of the physical error code and the response, if needed.

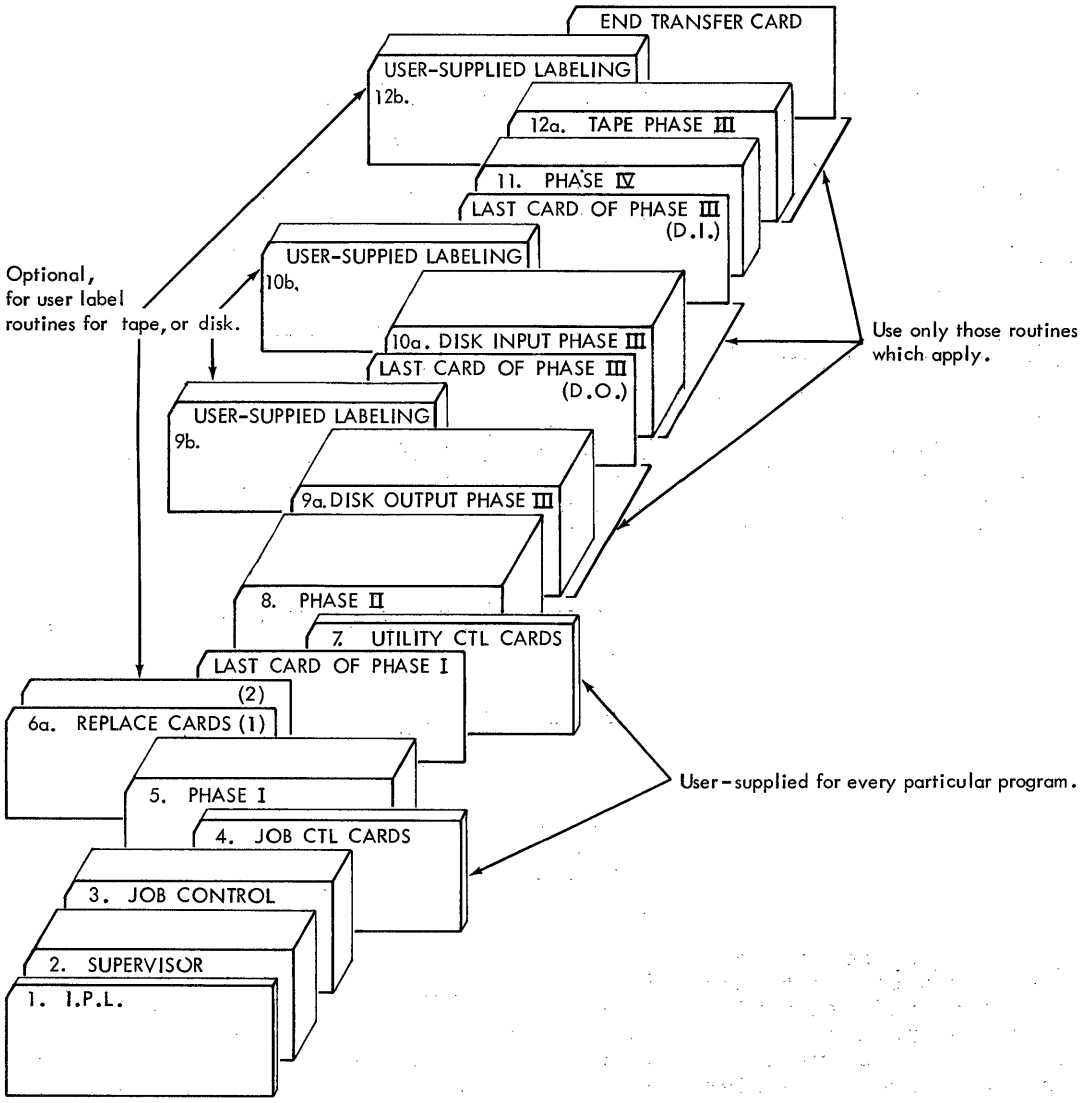

Figure 1. Program Object Deck Inserts

Note: Identification numbers are found in col. 73-80. For programs using disk, col. 73 identifies the card section. For any program, col. 74-76 identifies the utility program and col. 77-80 gives the sequence numbers (programs using tape are cumulatively sequenced). This chart gives the numbers of the first card in each section. Asterisks (*) indicate non-applicable card sections.

Programs	IPL	Supervisor	Job Control	Phase I	Phase II	Disk Output Phase III	Disk Input Phase III	Phase IV or Phase IV and Tape Phase III
CD (card to disk)	A0000001	B0630001	C0630001	D0630001	E0630001	F0630001	*	G0630001
CP (card to printer/punch)	10500001	10500005	10500058	10500109	10500170	*	*	10500241 - 0297
CT (card to tape)	10510001	10510005	10510057	10510104	10510165	*	*	10510231 - 0276
DC (disk to card)	A0000001	B0640001	C0640001	D0640001	E0640001	*	F0640001	G0640001
DD (disk to disk)	A0000001	B0670001	C0670001	D0670001	E0670001	F0670001	G0670001	H0670001
DP (disk to printer)	A0000001	B0730001	C0730001	D0730001	E0730001	*	F0730001	G0730001
DT (disk to tape)	A0000001	B0650001	C0650001	D0650001	E0650001	*	F0650001	G0650001
TC (tape to card)	10530001	10530005	10530057	10530104	10530165	*	*	10530232 - 0284
TD (tape to disk)	A0000001	B0660001	C0660001	D0660001	E0660001	F0660001	*	G0660001
TP (tape to printer)	10520001	10520005	10520058	10520109	10520170	*	*	10520232 - 0310
TT (tape to tape)	10540001	10540005	10540057	10540104	10540165	*	*	10540231 - 0302

● Figure 2. Program Deck Identification

Note 1: See Figure 1 as a pictorial guide and Figure 2 to eliminate the non-applicable card sections.

Note 2: Numbered sections followed by an alphabetic letter (6a.) are not applicable to all programs and usually have a user option involved. Details regarding these conditions are found in the utility programs publication listed on the front cover of this publication.

ORDER AND TYPE OF CARDS	FUNCTION AND PLACEMENT
1. Initial Program Loader	Brings in the program. All card sections can be identified with identification and sequenced numbers found in Figure 2.
2. Supervisor	Controls all I/O operations.
3. Job Control	Reads the job control cards necessary for channel and unit assignment and standard label processing.
4. Job Control Cards	See Figure 4. These are user-supplied.
5. Phase I	The program segment that reads the utility modifier card, field select cards, print header cards, END card, and stores the parameters for later use.
6a. Replace Cards (2)	Two cards required when a tape user label routine is desired. Placed before the last card of Phase 1. See 12b. for the other requirement for tape user label routine.
7. Utility Modifier Cards	See Figure 4. These are user-supplied.
8. Phase II	Performs the diagnostics on the parameters entered on the control cards and lists the various parameters on the SYSLOG device. It also determines the maximum I/O area and establishes I/O assignment.
9a. Disk Output Phase III	Opens and checks all the disk output volumes, and checks file labels.
9b. User-supplied Labeling	Required only when disk output Standard User Labels are used in addition to IBM Standard Labels. In this case the user routine must begin at these locations: Program: CD = 7192, DD = 7192, TD = 7192 This user label routine must be placed before the last card of the Disk Output Phase III section.
10a. Disk Input Phase III	Opens and checks all the disk input volumes, and checks file labels.
10b. User-supplied Labeling	Required only when disk input Standard User Labels are used in addition to IBM Standard Labels. In this case, the user routine must begin at these locations: Program: DC = 6232, DD = 6232, DP = 6232, DT = 6232 This user label routine must be placed before the last card of the Disk Input Phase III section.
11. Phase IV	Performs file-to-file processing. This is the program main line.
12a. Tape Phase III	Opens the volume(s) of the input and/or output file, and checks file labels during main line processing.
12b. User-supplied Labeling	Required only when tape user label option 1 or 2 is desired. 1. IBM Standard Labels and Standard User Labels-where the user routine must begin at these locations: Program: CT = 4850, DT = 6128, TC = 5250, TD = 6496, TP = 6150, TT = 6300 2. Non-Standard Labels-where the user routine must begin at these locations: Program: CT = 4200, DT = 5288, TC = 4500, TD = 5624, TP = 5390, TT = 4800 In either option, this user routine must be placed before the last card of the object deck and item 6a must be completed.

Figure 3. Condensed Card Deck Components

TYPE OF CONTROL CARD	FUNCTION (See Figure 1 for Deck Placement)
Job Control	
1. JOB	Required to define utility program type.
2. ASSGN	Required for I/O units assignment.
3. VOL	Required for tape label checking on IBM standard labels.
4. TPLAB	Required for tape label checking on IBM standard labels.
5. VOL	Required for disk label checking on IBM standard labels. (Not required for Initialize Disk or Clear Disk).
6. DLAB	Required for disk label checking on IBM standard labels. (Not required for Initialize Disk or Clear Disk).
7. XTENT	Required for disk extent definition.
8. DATE	Required for all programs.
9. UPSI	Not used for utility programs.
10. CONFG	Gives system configuration for all programs. If CONFG card is absent 8192 positions of main storage are assumed.
11. LOG or NOLOG	Optional--user can place anywhere between JOB and EXEC cards, except between items 3 and 4 or items 5, 6, and 7.
12. EXEC	Required for execution of all programs.
Utility Control	
1. Utility Modifier Card	Required card for supplying program functions and options other than assumed values.
2. Field Select Cards	Defines field selections.
3. Print Header Cards	Prints heading information, if desired by user.
4. END Card	Required to define end of control card section. Placed immediately before Phase II cards.

Figure 4. Respective Order of Control Cards

1. Ready the necessary I/O units.

2. Set console switches as follows:

   a. ROS CONTROL, RATE, ADDRESS COMPARE, and CHECK CONTROL switches to PROCESS

   b. Set the three LOAD-UNIT switches to the address of the card reader used for loading the program.

   c. Turn the INT TMR (interval timer) switch off.

3. Loading of the utility program.

   a. Check the above units and settings, then press the SYSTEM-RESET key.

   b. Place the object deck with control cards in the reader hopper.

   c. When the reader unit is ready, press the console LOAD key.

Figure 5. Operating Instructions for Running Object Programs

Note 1: Message print-outs will occur on a Printer or a 1052 Printer-keyboard. Coded message always will occur either on the:
(1) Printer-keyboard - where the program types a coded message. If the action warrants, the operator keys in a single-character response and the end-of-block character.
or
(2) Console Main Storage Data Register - when the 1052 is inoperative the program enters the Wait state. The operator presses the console stop key and interrogates bytes 0, 1, 2, 3, and 4 for the coded message. (The console display area uses 2 hexadecimal characters to represent a printer-keyboard character). If the action warrants, a coded response is keyed into byte 5. Then press the start and interrupt keys to continue.

Note 2: If the System/360 goes into a wait state which cannot be identified, the operator should check for physical errors. (see Figure 7).

Note 3: All codes and messages are printed, one code or message, to a line.

Note 4: Whenever xxx precedes a message, it indicates in which field definition the error occurred, e. g. card 1 and 2 each have 5 field definitions; for a format error in the third definition, xxx would be printed as 003; for a format error on the fifth definition of card 2, xxx would be printed as a cumulative 010.

Note 5. The following messages are for all programs unless otherwise specified.

Routine	Message	Code	Reason	Action
All routines		0901	Program Check	No restart; take a storage print. Examine the program. Check old PSW for error information.
		0701	Program Check	
		0702A	The 1052 request key has been pressed.	Key in 4 to continue with the program.
		0cuu	Device I/O error. The second character gives the channel number. The others give the unit information.	See Figure 7, Condition 2.
		BADT	A defective track has been found.	No restart is provided. See the Alternate Track Assignment Program.
Job Control		1050A 1040A 1110A 1200A 1220A 13xxA 1400A	Missing DATE card Missing JOB card Duplicate JOB card Invalid card, i.e., // not in col. 1 and 2. Invalid or missing control card Invalid field xx (field number) The VOL and TPLAB set must precede the VOL and DLAB set when using both tape and disk.	Reload program with corrected control cards.
		1703A	Pause card in deck	Should not occur since utility programs do not require or use a pause card. To continue, enter 2 blanks on the printer-keyboard, or press the interrupt key when the message is display on the console.
		1704A	Error in VOL card.	No restart. Reload program with corrected control cards.
Phase I	END CARD MISSING		No END card supplied (//END), or non-control card read before END.	Reload program with corrected control cards.
	x ILLEGAL FORMAT. UTILITY MODIFIER CARD		Format specifications for utility modifier card were not followed, or all required parameters were not supplied: x - Decoded message U - Undefined parameter (parmeter identifier not valid) N - Invalid type of program (U identifier (// U) not found or xx (representing the program type) not valid.	

● Figure 6. Respective Order of Messages (Part 1 of 10)

Routine	Message	Code	Reason	Action
			J - Invalid type of job (T parameter) T - T parameter missing (type of job parameter) M - Missing required parameter (F, A, B parameters must be present) F - Error in record format specifications (F parameter) A - Error in input format specifications (A parameter) B - Error in output format specifications (B parameter) I - Invalid input option (I parameter) O- Invalid output option (O parameter) S - Invalid spacing option (S parameter) P - Invalid page number option (P parameter) Q - Error in sequence checking specifications (Q parameter) R - Error in starting record specifications (R parameter)	
	FIELD SELECT CARD MISSING		Field select was indicated on utility modifier card, but no field select card was supplied.	
	xxx ILLEGAL FORMAT. FIELD SELECT CARD		Format specifications for field select card was not followed.	
	FIELD SELECT CARD NOT EXPECTED		Field select was not indicated on utility modifier card, but field select card was supplied.	
	INVALID CONTROL CARD		A control card (with //b in the first 3 columns) was read which was not a utility modifier, field select, print header, or END card.	
Phase II	CARD TO DISK UTILITY CARD TO PRINTER/PUNCH UTILITY CARD TO TAPE UTILITY DISK TO CARD UTILITY DISK TO DISK UTILITY DISK TO PRINTER UTILITY DISK TO TAPE UTILITY TAPE TO CARD UTILITY TAPE TO DISK UTILITY TAPE TO PRINT UTILITY TAPE TO TAPE UTILITY		Identifies the start of Phase II and the particular utility program.	No action. Program continues processing.
	INCORRECT PROGRAM		Utility modifier card punched with the wrong program initials , e.g., DT for a disk to card program.	Reload program with corrected control cards. Note that all succeeding messages may not have a valid meaning.

Figure 6. Respective Order of Messages (Part 2 of 10)

<table>
<tr><th>Routine</th><th>Message</th><th>Code</th><th>Reason</th><th>Action</th></tr>
<tr><td></td><td>x ILLEGAL FORMAT UTIL MOD CARD</td><td></td><td>x - Utility modifier card error

A - For non-disk input, a key field was used.

B - For non-printer output, a printer B format was used; for non-disk output, a key field was used.</td><td></td></tr>
<tr><td></td><td>INCORRECT INPUT DEVICE</td><td></td><td>Sample Error: For card to tape, a disk was listed as an input device on the ASSGN card.</td><td>Reload program with corrected control cards.</td></tr>
<tr><td></td><td>INCORRECT OUTPUT DEVICE</td><td></td><td>Sample Error : For card to tape, a disk was listed as an output device on the ASSGN card.</td><td></td></tr>
<tr><td></td><td>INVALID I/O DEVICE AT SYS00 (2, 3, 4, or 5)</td><td></td><td>Assignment card SYS00 (2, 3, 4, or 5) not a disk. This message applies only to the disk to disk program.</td><td></td></tr>
<tr><td></td><td>FIXED LENGTH RECORD FORMAT REQUIRED</td><td></td><td>a. Card input or card output was not fixed length.

b. Tape input or tape output was not fixed length for reblock, field select, reblock and field select.

c. Printer output was not fixed length for list or list with field select.

d. Disk input and disk output was not fixed length for reblock, field select, reblock and field select, and whenever key fields are present.</td><td></td></tr>
<tr><td></td><td>INVALID JOB FOR THIS PROGRAM</td><td></td><td>
<table>
<tr><th>Program</th><th>Valid Types</th><th>Invalid Types</th></tr>
<tr><td colspan="3">Variable length and undefined records</td></tr>
<tr><td>a. TP and DP</td><td>D</td><td>C,B,BF,F,L, LF,R,RF.</td></tr>
<tr><td>b. DD,DT, TD,and TT.</td><td>C</td><td>B,BF,D,F,L, LF,R,RF.</td></tr>
<tr><td colspan="3">Fixed length records</td></tr>
<tr><td>a. CP</td><td>B,BF,C, D,F,L, LF</td><td>R,RF</td></tr>
<tr><td>b. TP and DP</td><td>D,L,LF</td><td>B,BF,C,F,R, RF</td></tr>
<tr><td>c. CD,CT, DC,DD, DT,TC, TDand TT.</td><td>C,F,R, RF</td><td>B,BF,D,L, LF</td></tr>
<tr><td>d. For key fields, DD</td><td>F,C</td><td>B,BF,D, L,LF,R,RF</td></tr>
<tr><td>e. For key fields, DC,CD, DT and TD</td><td>F</td><td>B,BF,C,D, L,LF,R,RF</td></tr>
</table>
</td><td></td></tr>
</table>

● Figure 6. Respective Order of Messages (Part 3 of 10)

Routine	Message	Code	Reason	Action
	INVALID INPUT RECORD LENGTH		a. Card input - Record length was greater than 80 or 160 (EBCDIC and Binary, respectively). b. Tape input - Record length was greater than 4096. c. Disk input without key - Block length was not a multiple of the record length.	
	INVALID OUTPUT RECORD LENGTH		a. Card output - Record length was greater than 80 or 160 (EBCDIC and Binary, respectively). b. Tape output - Record length was greater than 4096. c. Printer output - Record length was greater than 144. d. Disk output without keys- Block size was not a multiple of record length.	
	INVALID INPUT KEY LENGTH		For a disk input the key length was greater than X'FF' or a decimal 255.	
	INVALID OUTPUT KEY LENGTH		For a disk output the key length was greater than X'FF' or a decimal 255.	
	INVALID INPUT BLOCK LENGTH		a. Tape input - input block length was not a multiple of the record length. b. Card input - the block and record length were not equal. c. Disk input without keys - the block size was greater than 3625.	
	INVALID OUTPUT BLOCK LENGTH		a. Tape output - block length was not a multiple of the record length. b. Disk output - block length was greater than 3625.	
	INVALID INPUT DATA LENGTH		Disk input programs with key require data length plus key length to be less than or equal to 3605.	
	INVALID OUTPUT DATA LENGTH		Disk output programs with key require data length plus key length to be less than or equal to 3605.	

Figure 6. Respective Order of Messages (Part 4 of 10)

Routine	Message	Code	Reason	Action
	INVALID INPUT OPTION		Option specified incorrect for the program. No option for disk input.	
	INVALID OUTPUT OPTION		Option specified incorrect for the program.	
	INVALID CARD SEQUENCE		Card Programs. Either the length parameter specifies over 10 characters, or the starting position and the length is over 80 characters.	
	I/O AREA CANNOT BE ASSIGNED		Not enough main storage to assign the specified input/output areas.	
	xxx INVALID UNPACK OUTPUT LENGTH		The parameter values givenwere invalid.	
	xxx INVALID PACK OUTPUT LENGTH			
	xxx RECORD CAPACITY EXCEEDED BY PACK		Starting position of the input record length plus the input field length exceeds the input record length, or the starting position of the output record length plus the output field length exceeds the output record length.	
	xxx RECORD CAPACITY EXCEEDED BY UNPK			
	xxx RECORD CAPACITY EXCEEDED BY FS			
	xxx RECORD CAPACITY EXCEEDED BY HEX			
	FIELD SELECT MUST BE SPECIFIED		When the output record length differs from the input record length, Field Select must be used. For printer programs, list function, the input record length cannot exceed the size of the print line. For disk programs with key fields, except disk to printer, field select must be specified.	
	xxx FIELD SELECT PARAMETER FOR NONEXISTENT KEY		A key field was specified in the field select card and no key was indicated in the utility modifier card.	
	xxx FS INPUT LENGTH EQUALS ZERO		Input field length has been specified as zero.	
	xxx PACK INPUT LENGTH EQUALS ZERO			
	xxx UNPK INPUT LENGTH EQUALS ZERO			
	xxx HEX INPUT LENGTH EQUALS ZERO			
	xxx CANNOT PROCESS HEX PARAMETER		Hexadecimal indicator valid only for print output programs.	
	xxx CANNOT PROCESS PACK PARAMETER		Cannot pack a field for printed output programs.	
	Control parameter diagnostics are followed by the logging messages in this order.			
	TYPE COPY REBLOCK REBLOCK, FIELD SELECT FIELD SELECT LIST LIST, FIELD SELECT DATA DISPLAY PRINT AND PUNCH PRINT, PUNCH, FIELD SELECT			

Figure 6. Respective Order of Messages (Part 5 of 10)

	RECORD FORMAT FIXED VARIABLE UNDEFINED
	INPUT RECORD LENGTH xxxx (x represents a variable quantity)
	OUTPUT RECORD LENGTH xxxx
	INPUT KEY LENGTH xxxx
	OUTPUT KEY LENGTH xxxx
	INPUT BLOCK SIZE xxxxx
	OUTPUT BLOCK SIZE xxxxx
	INPUT DATA SIZE xxxxx
	OUTPUT DATA SIZE xxxxx
	INPUT OPTION CARD BINARY CARD BCD TAPE REWIND TAPE MULTIPLE TAPE REWIND, UNLOAD NO REWIND, UNLOAD
	OUTPUT OPTION CARD BINARY CARD BCD TAPE REWIND TAPE REWIND, UNLOAD NO REWIND, UNLOAD PRINT HEX PRINT CHARACTER BCD, CHARACTER DISK WRITE CHECK NO DISK WRITE CHECK
	x INPUT, x OUTPUT AREAS ASSIGNED
	x INPUT/OUTPUT AREAS ASSIGNED
	STARTING RECORD NUMBER xxxx
	STARTING SEQUENCE COLUMN xx
	SEQUENCE LENGTH xx

Routine	Message	Code	Reason	Action
Phase III		3ICHA	Label card image does not agree with the tape input header file label.	Options: 1) To bypass the error condition, press the start and interrupt keys without entering a coded byte. 2) To retry, the operator mounts another tape reel, then keys in code R.
		3IVSA	First tape volume serial number is not the same as that specified in the file serial number field on the TPLAB card.	
		3ISQA	When processing multiple reel files, the volume sequence number (field 5 of the HDR1 file label) is found out of sequence.	
		3ISLA	Standard volume label has not been found on tape.	No option. Operator mounts reel and presses the console interrupt key.
		3IHDA	Standard tape input HDR1 label has not been found on tape.	
		3IBCA	Block count of tape input trailer file label does not match the computed block count.	No option; program continues.
		3LCMA	For all tape programs, the file name is incorrect. For the tape to tape program, either the file name is incorrect or a label card is missing.	Program is terminated. Reload the program with corrected label cards.
	NO EOV OR EOF		Trailer label read does not contain EOV (end-of-volume) or EOF in bytes 1-3 of the label.	Operator keys in code Y for EOF condition, or N for EOV condition and the program continues.

Figure 6. Respective Order of Messages (Part 6 of 10)

Routine	Message	Code	Reason	Action
		3OSLA	Tape output reel does not contain standard volume label.	No option. Operator mounts another tape reel and presses console interrupt key.
		3OEDA	Tape output HDR file label indicates that the file is not expired.	Options: 1. To bypass the error condition press the console start and interupt keys, or press the 1052 space bar twice. 2. To retry, operator mounts another tape reel and keys in code R.
		3OVSA	First output tape volume serial number differs from that specified in the file serial number field on the TPLAB card.	
		3OHDA	Output standard header label (HDR1) is not found.	
	Note 1: The following disk label checking messages beginning with 4 will be preceded by the message 4cuu to identify the channel (c) and unit (uu) of the disk pack in question. Note 2: For the disk label checking messages, an operator action of 0 or 1 terminates the job. When this is the only action, any other response gives a 0 response. However, if 4 is an option, any other response will act as a 4 to continue processing.			
		3333	a. For disk input, the XTENT card specifies other than SYSIPT 002, 003, 004, or 005. b. For disk output, the XTENT card specifies other than SYSOPT, 002, 003, 004, or 005.	No action. Program is terminated.
		3434	XTENT card specifies SYSOPT, SYSIPT, 002, 003, 004, or 005, but that assigned unit is not a 2311.	
		4301A	No format-1 label can be found for the input file on the disk pack.	1. Key in 4 to accept unverified extent from control-card records. 2. Key in 0 or 1 to terminate the job.
		4304A	No format-4 label can be found for the input file on the disk pack.	Key in 0 or 1 to terminate the job.
		4305A	No volume label can be found for the input file on the disk pack.	
		4307A	No extent control-card record can be found for the input file in upper main storage.	
		4308A	No DLAB control-card record can be found for the input file in upper main storage.	
		4310A	A data check occurred while reading input-file count field.	
		4311A	An error occurred while reading an input-file format-1 label.	1. Key in 4 to ignore the error and continue processing. 2. Key in 0 or 1 to terminate the job.
		4313A	An error occurred while reading an input-file format-3 label.	

Figure 6. Respective Order of Messages (Part 7 of 10)

Routine	Message	Code	Reason	Action
		4314A	An error occurred while reading an input-file format-4 label.	1. Key in 4 to ignore the error and continue processing. 2. Key in 0, or 1, to terminate the job.
		4315A	An error occurred while reading an input-file volume label.	
		4316A	An error occurred while reading an input-file user label.	
		4330A	The DLAB record and format labels for the input file do not match.	1. Key in 4 to ignore the error and continue processing. 2. Key in 0 or 1 to terminate the job.
		4342A	Limits on the extent-control card are not within the limits specified in the input-file label.	1. Key in 4 to continue processing using the extents specified in the extent-control cards. 2. Key in 0 or 1 to terminate the job.
		4343A	Input-file format-3 indicated by the pointer cannot be found.	
		4355A	Wrong pack mounted; i.e., the volume serial number in the volume label of the pack does not match the volume serial number in the extent specified.	1. Mount the correct pack and key in 4 to continue processing. 2. Key in 0 or 1 to terminate the job.
		4466	A one track extent specified as the first extent on the volume. User-labels are requested.	The program is terminated automatically.
		4400A	No space in VTOC for new label.	Key in 0 or 1 to terminate the job.
		4401A	No output-file format-1 label can be found.	
		4403A	No output-file format-3 label can be found.	
		4404A	No output-file format 4 label can be found.	
		4405A	No output-file volume label can be found.	
		4406A	No UTL0 record (file mark) can be found. (No trailer labels can be written).	
		4407A	No output-file extent-control-card record can be found in upper main storage.	
		4408A	No output-file DLAB control-card record can be found in upper main storage.	
		4410A	A data check occurred while reading output-file count field.	
		4411A	An error occurred while reading an output-file format-1 label.	1. Key in 4 to ignore the error and continue processing. 2. Key in 0 or 1 to terminate the job.
		4413A	An error occurred while reading an output-file format-3 label.	
		4414A	An error occurred while reading an output-file format-4 label.	

Figure 6. Respective Order of Messages (Part 8 of 10)

Routine	Message	Code	Reason	Action
		4415A	An error occurred while reading an output-file volume label.	
		4419A	A read error occurred while searching the output-file VTOC.	1. Key in 4 to ignore the error and continue processing. 2. Key in 0 or 1 to terminate the job.
		4441A	The extent limits overlap the output-file VTOC.	Key in 0 or 1 to terminate the job.
		4444A	The extent limits overlap the unexpired output file.	1. Key in 4 to delete the file and continue processing. 2. Key in 0 or 1 to terminate the job. 3. For the initialize disk program, other entries terminate the pack from further processing and continue on the next assigned drive.
		4448A	Output-file extent is not type one.	1. Key in 4 to ignore the extent and continue processing. 2. Key in 0 or 1 to terminate the job.
		4455A	Wrong pack mounted. i.e. volume serial number in the volume label of the pack does not match the volume serial number in the extent specified.	1. Mount correct pack, and key in 4 to continue processing. 2. Key in 0 or 1 to terminate the job.
Phase IV	INCORRECT BLOCK LENGTH AT BLK NO: xxxxxxx		Block length incorrect, where 7 x's represent the incorrect block number.	No action. Program continues processing.
		3ABT	Labels have been specified but not as multiple reels (IM). The EOV label has been reached instead of the EOF label.	No action; the program goes into the wait state (the header label routine has been overlayed).
		3ANSA	Trailor label read does not contain EOV or EOF in bytes 1-3 of the label or the tapes are unlabelled.	Operator keys in Y for EOF condition, or N for EOV condition.
	END OF TAPE REEL 0cuu		Tape reel completed where 0cuu represents the channel (c) and unit (uu) number of the address of the device.	No action. Program continues processing.
	CARD SEQUENCE ERROR CURRENT SEQ xxxxxxxxxx LAST SEQ xxxxxxxxxx		Input card found that is not in ascending sequence.	
	OUTPUT CAPACITY EXCEEDED		Output area specified in the XTENT control card, exceeded for disk output program.	Program terminated.

Figure 6. Respective Order of Messages (Part 9 of 10)

Routine	Message	Code	Reason	Action
	END OF VOLUME xxx y		Either an extent has been filled or end-of-file has been reached. In either case the last disk address used is given. xxx means cylinder number, y means track number.	No action. Program continues processing.
	END OF DATA		Immediately after END OF DATA is printed, a skip to channel 1 occurs to print END OF JOB. For data displays, before skipping to channel 1, the program skips to channel 12 to print the scale line.	
	END OF JOB		Program reached the end-of-file condition.	No action...Job is finished.

Figure 6. Respective Order of Messages (Part 10 of 10)

Condition 1.

If a physical error occurs from which no recovery is possible, the system enters the wait state. The B-register and A-register should have a X'FFFF' and the operator should display main storage byte X'32' to obtain the error code. The codes are:

Code	Meaning	Action
00	Machine check. The processing unit has malfunctioned and the diagnostic information can be found by examining the diagnostic scan-out area starting at X'80'.	No restart is provided. Take a storage print. SEREP (System Environment Recording, Edit and Print), is the storage print recommended .
0F	Channel error. Examine CSW (X '40' through X '47') and I/O old PSW (X '38' through X '3F').	
1F	Unit check. Examine sense byte characters from X'18'.	
3F	Non-existent device. Examine I/O old PSW (X '38' through X '3F').	

Sense byte characters not printed (found in a storage print at X'18' and X'19' in addition to any of the following)

Code	Meaning
1nnn	(a) 2540 Card Punch - Bit posted in channel control block of the program; processing continued. (b) Tape Unit - Equipment check caused program termination. (c) Disk Unit - Equipment check caused retrying error 10 times unsuccessfully with program termination.
2nnn	(a) Tape Unit - Bus out caused retrying the error 100 times on a read operation, or 3 times on a write operation unsuccessfully with program termination. (b) Disk Unit - Bus out caused retrying 10 times unsuccessfully with program termination.
8nnn	Command rejected for an invalid, missing, or incorrect command.
n1nn	(a) Tape and Unit Record Devices - Bit posted in channel control block of the program; processing continues. (b) Disk unit - Seek check caused 10 unsuccessful retries with program termination.
n2nn	(a) Unit Record Devices - Bit posted in the channel control block of the program; processing continues. (b) Disk Unit - Defective track caused program termination.
n4nn	Disk Drive or 1442 Card Read Punch - Overrun i.e. information received is incorrect or incomplete.

Condition 2.

When any other physical error occurs the system enters the wait state and two messages are printed on the printer-keyboard. If the printer-keyboard is inoperative or not available, the operator must display the first message in bytes 0-3 to obtain the I/O device concerned. He must then press start and interrupt and display bytes 0-4 for the second message. The first message has the format 0cuu, which has the channel (c) and unit (uu) address of the I/O device on which the error occurred. The second message has the format nnnnA. In this case, however, the first two characters are used to indicate errors which could occur for any device in the system; these characters control the operator's response. The third and fourth characters indicate additional information for tape units. Preceding the list of sense byte characters (second message) are two hypothetical examples of a second message:

Example 1. 8002A. Depending on the device address the "2" indicates a tape or disk message. "8" refers to 'Command Reject' and controls the list of recommended operator actions. "2" refers specifically to "tape is in file-protect status" (assuming address was a tape drive).

Example 2. A000A. Meaning physical errors "Bus out check" (2) and "Command Reject" (8) occurred simultaneously. The operator should correct possible conditions and key in a single reply (into byte 5 if the console is used).

Figure 7. Physical Error Message Codes (Part 1 of 2)

Printed Sense Byte Characters (second message)		
Message	Meaning	Action
0nnnA	None	Examine remaining characters.
1nnnA	Equipment check.	Examine the I/O device for trouble, and then: (1) Key in 5 to retry (2) Key in 4 to bypass the error and continue. This option may result in a loss of a printed line. (3) Key in 0 or 1 to terminate the job, and take storage print.
2nnnA	Bus out (parity error)	
4nnnA	Intervention required (the device isn't ready).	
8nnnA	Command reject	
n8nnA	Data check (invalid code)	
n0nnA	None	Examine the remaining characters.
Message	Tape Meaning	Disk Meaning
nn0nA	None. Examine remaining characters.	
nn1nA	The seven track feature has been installed.	Invalid sequence of commands.
nn2nA	Unit not ready	End of cylinder
nn4nA	Unit ready and not rewinding i.e. status not cleared.	Track overrun - attempt to write past index.
nn6nA	Tape unit ready and rewinding	Conditions nn2nA and nn4nA occurred simultaneously.
nn8nA	Should not occur	Data check in the count field.
nnn0A	If third character is zero--a non-existent unit has been referred to, otherwise there is no meaning.	
nnn1A	Tape indicator light is ON.	Overflow incomplete.
nnn2A	Tape unit is in file-protected status.	Missing address markers.
nnn4A	Tape unit in write status.	File mark was violated.
nnn8A	Unit at load point.	No record found.

Figure 7. Physical Error Message Codes (Part 2 of 2)

SPECIAL UTILITY PROGRAMS

Any common operating instruction for these utility programs will be contained in the first section of this publication. Again, for the convenience of the operator, each step is presented as a quick-reference chart, either in the respective order, or referenced to the proper figures in respective order. This section includes the following utility programs with descriptions.

Alternate Track Assignment Program includes charts:

- Program Object Deck Inserts (Figure 8)
- Identification of the Alternate Track Assignment Card Deck Components (Figure 9)
- Respective Order of Messages (Figure 10)

Clear Disk Program includes charts:

- Program Object Deck Inserts (Figure 11)
- Identification of the Clear Disk Card Deck Components (Figure 12)
- Messages for Clear Disk (Figure 13)

Initialize Disk Program includes charts:

- Program Object Deck Inserts (Figure 14)
- Identification of the Initialize-Disk Card Deck Components (Figure 15)
- Messages for Initialize Disk (Figure 16)

Initialize Tape Program includes charts:

- Program Object Deck and Control Card Inserts (Figure 17)
- Program Deck Identification Numbers (Figure 18)
- Respective Order of Control Cards (Figure 19)
- Initialize Tape Error Messages (Both Options) (Figure 20)
- Initialize Tape Error Messages (Card Image Option) (Figure 21)
- Initialize Tape, Execution Logging Messages (Figure 22)

Multiple Utility Program includes charts:

- Program Object Deck and Control Card Inserts (Figure 23)
- Program Deck Identification Numbers (Figure 24)
- Respective Order of Control Cards (Figure 25)
- Assignment Phase Messages (Figure 26)
- Redefinition Phase Messages (Figure 27)
- Open/Close Phase Messages (Figure 28)

Storage Print Program: requires only one card to be supplied by the user. Error messages and procedures are not necessary.

The operating instructions, general messages, and physical error messages found in Figures 5, 6, and 7, apply to this set of programs, and will be referenced as needed.

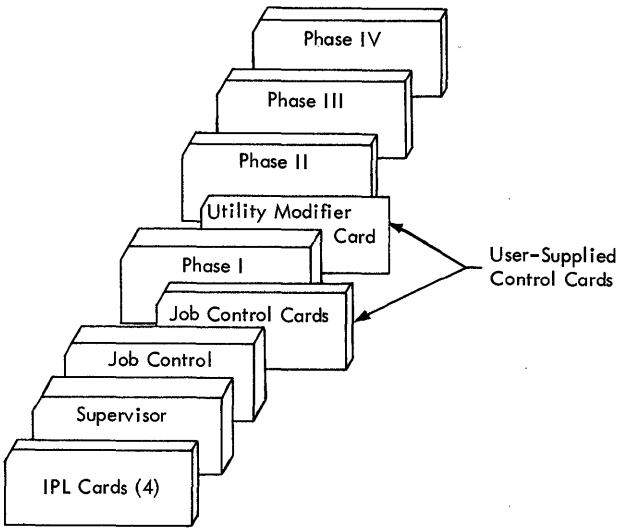

Figure 8. Program Object Deck Inserts

Note: The following cards have a section identifier in col. 73, a program identifier in col. 74-76, and sequence numbers (beginning with 0001 for each card section) in col. 77-80. The ID NUMBER is found in cols. 73-76.

CARD SECTIONS	ID NUMBER	FUNCTION
IPL	A000	The Initial Program Loader brings in the program.
Supervisor	B098	Control all I/O operations.
Job Control	C098	Reads the job control cards necessary for System/360 channel and unit assignment.
Job Control Cards	User supplied	See Figure 4 for the order and function. No label job control cards are needed.
Phase I	D098	Reads and diagnoses the utility-modifier card and the remaining job-control cards. It also assigns an alternate track for the defective track.
Utility Modifier Card	User supplied	Identifies the defective track and determines whether its invalid record(s) should be printed.
Phase II	E098	Transfers data from the defective track to an assigned alternate track. If the printer option is on, it also prints the invalid record.
Phase III	F098	Writes on the track in error and checks for defects. If the track is permanently defective, the program goes to the end-of-job.
Phase IV	G098	If the surface analysis found the track temporarily defective, this phase transfers the data from the alternate track back to the temporarily defective track and updates the VTOC to reflect the status of the pack.

Figure 9. Identification of the Alternate Track Assignment Card Deck Components

Routine	Codes	Messages	Reason	Action
Phase I		ASSIGN ALTERNATE TRACK	Identifies program.	None. Processing continues.
		JOB CARD NOT ATASGN.	Job not properly identified.	Reload the program with corrected control cards.
		SYSOPT NOT A 2311 DISK DRIVE.	SYSOPT is not a disk drive or was never assigned.	
		UTILITY MODIFIER CARD MISSING.	User did not supply the necessary utility modifier card.	
		UTILITY MODIFIER CARD	This heading is followed by the control-card parameters.	None. Processing continues.
		INVALID CARD.	Utility modifier card identified improperly.	Reload the program with corrected control cards.
		PARAMETER MISSING.	Parameter designating the record location is missing.	
		INVALID FORMAT.	Format is incorrect (either a parameter is missing or it is out of order).	
		INVALID PARAMETER.	Parameter value is incorrect.	
	3404A		No format-4 label can be found.	Key in 0 or 1 to terminate job.
	3405A		No volume label can be found.	
	3410A		Data check in count field occurred while reading VOL1 or format-4.	
	3414A		Error occurred while reading format-4 label.	1. Key in 4 to ignore error and continue processing.
	3415A		Error occurred while reading volume label.	2. Key in 0 or 1 to terminate job.
		ALT CYLS FULL.	No alternate track is available for assignment.	The program is automatically terminated.
		CYL xx, TRK xx, R0 ERR.	The portion of the alternate track where record zero is written is defective.	
Phase II		xxxxxxxxxxxxxxxx	The 16 hexadecimal character or eight byte, count field(s) on the track are printed out as they are transferred, providing no errors occur.	None. Processing continues.
		ERREC4	The track is defective in the home address or record zero area.	Job is terminated.
		DATA CHK IN CNT FLD, BYPASS RECORD.	A data check occurred while reading the count field. This record is not transferred to the alternate track.	None. This record is not formatted on the track, but processing continues.
		xxxxxxxxxxxxxxxx INVALID RECORD	The 16 hexadecimal character, or eight byte, count field plus INVALID RECORD indicate an error has occurred in the record other than the count field area. The following message ERREC1 (2 or 3) identifies the error. The record will then be typed on the printer or printer-keyboard, if the printer option was specified.	None. Processing continues.

Figure 10. Respective Order of Messages (Part 1 of 2)

Routine	Codes	Messages	Reason	Action
		ERREC1	The key and data portion of this record has been recovered but may be in error.	None. This record is formatted on the alternate track with key and data fields as read. Processing continues.
		ERREC2	The key and data portion of this record cannot be recovered.	No action. This record is formatted with the fill character A (EBCDIC).
		ERREC3	The key portion of this record is recovered, but may be in error. The data cannot be recovered.	No action. This record is formatted with the key field as read, but the data field is formatted with the fill character A (EBCDIC).
Phase III (surface analysis)		CYL xx, TRK xx, MSG 1.	The cylinder and track is identified by hexadecimal characters. Message 1 means this track is permanently defective.	None. Processing continues.
		CYL xx, TRK xx, MSG 2.	Message 2 means this track is temporarily defective.	
		CYL xx, TRK xx, R0 ERR.	The portion of the track where record zero is written is defective.	No correction procedure. The program is automatically terminated.
Phase IV		TRANSFER DATA TO ORIGINAL DEFECTIVE TRACK.	Track had a temporary error. Data is transferred to the original track.	None. Processing continues. This track should be printed for verification.
		EOJ	End-of-job (program).	No action. Job is done.

Figure 10. Respective Order of Messages (Part 2 of 2)

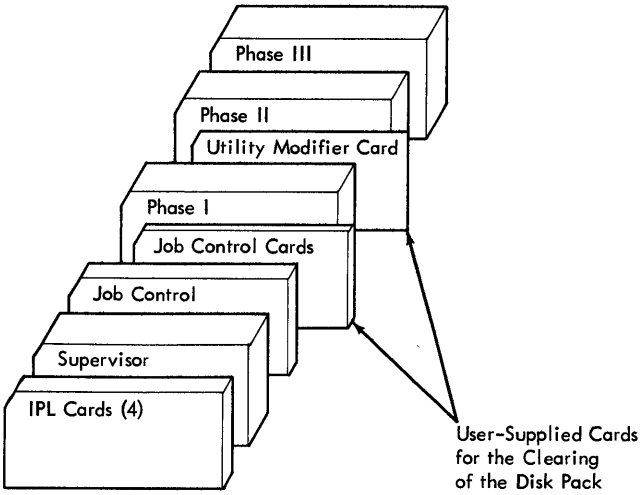

Figure 11. Program Object Deck Inserts (Clear Disk)

Note: The following cards have a section identifier in col. 73, a program identifier in col. 74-76, and sequence numbers (beginning with 0001 for each card section) in col. 77-80. The ID NUMBER is found in cols. 73-76.

CARD SECTION	ID NUMBER	FUNCTION
Initial Program Loader	A000	These four cards bring in the program.
Supervisor	B068	Controls all I/O operations.
Job Control	C068	Reads the job control cards necessary for System/360 channel and unit assignment and standard label processing.
Job Control Cards	User-Supplied	See Figure 4 for the order and function.
Phase I (Control Analysis)	D068	Performs diagnostics on Job Control information and the utility modifier card relating to the utility program.
Utility Modifier Card	User-Supplied	Utility control card to supply information to the main program.
Phase II (Header Label Check)	E068	Label checks the disk packs to insure that there are no unexpired files on the areas to be cleared.
Phase III (Main Line)	F068	Clears the disk as specified by the control parameter.

Figure 12. Identification of the Clear Disk Card Deck Components

Note: See Figure 5 for the operating instructions for running the object program. Messages (other than those common to All Routines, Job Control, and Labeling information, as identified in Figure 6) will follow as they may occur. If additional message information is needed, see the Notes in Figure 6.

ROUTINE	MESSAGE	REASON	ACTION
Phase I	CONTROL CARD ANALYSIS	Identifies the section to be checked.	None; processing continues.
	JOB CARD NOT CLRDSK.	Job not identified properly.	Reload the program with corrected control cards.
	NO XTENTS.	No record extent (limits) provided in the XTENT card.	
	INVALID XTENT CARD.	a) XTENT card specifies other than SYSOPT, 002, 003, 004, or 005. b) XTENT card specifies SYSOPT, 002, 003, 004, or 005, but the assigned unit is not a 2311.	
	MORE THAN 5 XTENTS.	Program has more than five areas specified.	
	UTILITY MODIFIER CARD	Occurs when a utility modifier card is found. The utility modifier card is printed after this message.	None; processing continues.
	INVALID CARD.	Utility modifier card is identified improperly.	Reload the program with corrected control cards.
	INVALID FORMAT.	Format (out of order, sections missing, etc.) incorrect.	
	INVALID PARAMETER.	Parameter value specified is specified incorrectly.	
	BLOCK LENGTH INVALID.	Data and/or key length specified incorrectly.	
	INVALID OUTPUT PARAMETER.	Output parameter was not either Y or N.	
	Diagnostics are followed immediately by logging messages in this order:		
	UTILITY MODIFIER CARD PARAMETERS KEY LENGTH - x(xx). DATA LENGTH - x(xxx). FILL CHARACTER - x(x). OUTPUT PARAMETER - (either Y or N) NO UTILITY MODIFIER CARD, ASSUME FOLLOWING KEY LENGTH - 0. DATA LENGTH - 100. FILL CHARACTER - 00. OUTPUT PARAMETER - Y. RECORDS/TRACK - xxx. SYSOPT (002, 003, etc.) CHANxx, UNIT NO xx LIMITS LOWER (CYL HEAD) UPPER (CYL HEAD) XTENT xx xx xx xx (given in hex) DATE (print date information)		
Phase II	LABEL CHECKING (label checking routine started, diagnostic messages, as found in Figure 6 disk output label checking, may follow).		
Phase III	MAIN LINE (main line routine started, IOCS error messages may follow). EOJ (printed at end of job).		

Figure 13. Messages for Clear Disk

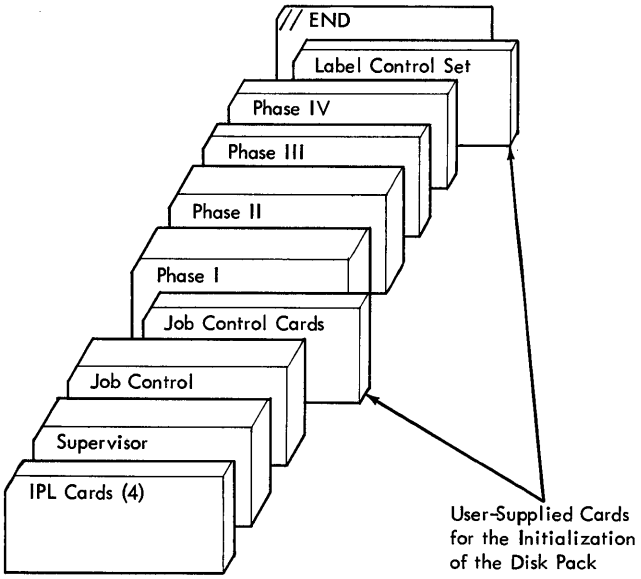

Figure 14. Program Object Deck Inserts (Initialize Disk)

Note: The following cards have a section identifier in col. 73, a program identifier in col. 74-76, and sequence numbers (beginning with 0001 for each card section) in col. 77-80. The ID NUMBER is found in cols. 73-76.

CARD SECTIONS	ID NUMBER	FUNCTION
IPL	A000	The Initial Program Loader brings in the program.
Supervisor	B069	Controls all I/O operations.
Job Control	C069	Reads the job control cards necessary for System/360 channel and unit assignment and standard label processing.
Job Control Cards	User supplied	See Figure 4 for the order and function. No label job control cards are needed.
Phase I	D069	Performs the job control and utility modifier diagnostics relating to the utility program. It also performs label checking on the disk packs to insure that there are no unexpired files.
Phase II	E069	Writes the home address on each pack initialized.
Phase III	F069	Writes the fill character and record zero (R0) on each track and checks for any defects. If tracks are defective, this routine will assign alternate tracks.
Phase IV	G069	Formats the two IPL records, enters the volume labels, and formats the VTOC (Volume Table of Contents). It also reads the necessary control cards.
Label Control Set	User supplied	Provides the control information for creating the VTOC (Volume Table of Contents) and volume labels.

Figure 15. Identification of the Initialize-Disk Card-Deck Components

Note: See Figure 5 for the operating instructions for running the object program. Messages (other than those common to All Routines, Job Control and Disk Labeling information as identified in Figure 6) will follow as they may occur. Refer to the Notes in Figure 6 for any other message information.

Routine	Codes	Messages	Reason	Action
Phase I		CONTROL CARD ANALYSIS AND LABEL CHECKING	Identifies the phase. (All disk-output label-checking messages are found in Figure 6.)	None. Processing continues.
		JOB CARD NOT INTDSK.	Job not identified properly.	Reload program with corrected control cards.
		SYSOPT NOT DEFINED.	SYSOPT not assigned.	
		SYSOPT (002, 003, etc.) NOT A 2311 DISK DRIVE.	The indicated unit is not a disk drive.	
Phase II		HA GENERATION (home address)	Identifies the function of this phase.	None. Processing continues.
		SYSOPT (002, 003, etc.)	Symbolic units are logged beginning with SYSOPT. If there is an error for that device, it will immediately follow that message.	
		HA ERR ON CYL xx, ALT TRK NOT ASSIGNED.	The portion of track where home address is written is defective.	No correction procedure. The home address is written on the remaining track of the pack; however, the pack will be deleted from further processing.
Phase III		SURFACE ANALYSIS AND R0 GENERATION	Identifies the function of this phase.	None. Processing continues.
		SYSOPT (002, 003, etc.)	Disk packs to be processed will be logged with their respective message starting with SYSOPT.	
		CYL xx, TRK xx, MSG 1.	The cylinder and track are identified by hexadecimal characters. Message 1 means the track on the alternate cylinder is defective. An alternate track is not assigned.	
		CYL xx, TRK xx, MSG 2.	The main area of the track identified by the cylinder and track number is defective. An alternate track is assigned.	None. Processing continues.
		CYL xx, TRK xx, MSG 3.	This defective track cannot be assigned an alternate track. The alternate cylinders are full.	No correction procedure. Surface analysis and R0 generation are performed on the rest of the pack; however, the pack will be deleted from further processing.
		CYL xx, TRK xx, R0 ERR.	The portion of the track where record zero is written is defective.	
Phase IV		LAB CYL CREATION	Identifies the function of this section.	No action. Processing continues.
		SYSOPT (002, 003, etc.)	The disk packs are identified with their respective messages if any.	
		SYSOPT (002, 003, etc.) DELETED.	The identified disk pack is deleted from further processing.	

Figure 16. Messages for Initialize Disk (Part 1 of 2)

Routine	Codes	Messages	Reason	Action
	3LC1A		VTOC card is missing or is incorrect.	1. Correct the cards in the volume label set (beginning with //bVTOC card followed by VOLn cards). 2. Place in the read hopper, and ready the reader. 3. If the printer-keyboard is used, space until the program takes control. If no printer-keyboard is used, press the console INTERRUPT.
	3LC2A		Invalid VTOC start address or invalid (or missing) EXTENT parameter.	
	3LC3A		Assigned VTOC area overflows the cylinder.	
	3LC4A		VOL1 card missing or incorrect volume card.	
	3LC5A		VOL1 card has blanks in volume serial field.	
	3LC6A		Wrong VTOC or END control card, or END card is missing.	
	3LC7A		VTOC card sets and the number of assigned packs are not equal.	
	3LC8A		Comma or blank must be after the parameter.	
		EOJ	End of Initialize Disk Program.	No action. Job finished.

Figure 16. Messages for Initialize Disk (Part 2 of 2)

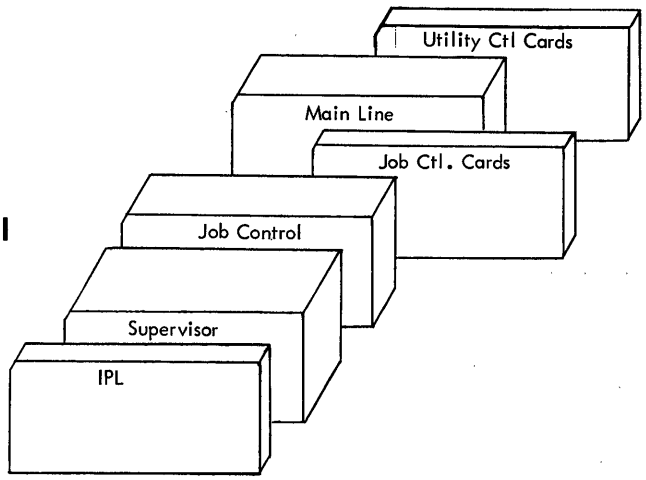

Figure 17. Program Object Deck and Control Card Inserts

Initialize Tape Program Phases	Program ID cols. 73-76	Sequence Numbers cols. 77-80
IPL	1057	0001
Supervisor	1057	0006
Job Control	1057	0059
Main Line	1057	0111-0180

Figure 18. Program Deck Identification Numbers

Type of Control Card	Function
Job Control	
1. JOB	Required to define utility program type.
2. ASSGN	Required for I/O units assignment.
3. DATE	Required by Job Control.
4. UPSI	Not used for utility programs.
5. CONFG	Gives system configuration for all programs. If the CONFG card absent 8,192 positions of main storage is assumed.
6. LOG or NOLOG	Optional -- user can place anywhere between JOB and EXEC cards.
7. EXEC	Required for execution of all programs.
Utility Control	
1. Label Creation Cards	Required to define the volume label (s).
2. END Card	Defined end of control cards.

Figure 19. Respective Order of Control Cards

Note: See Figure 5 for the operating instructions for running the program. Messages (other than those common to All Routines, Job Control, and labeling information as identified in Figure 6) will follow as they might occur. If additional message information is needed, see the 'notes' in Figure 6 .

Routine	Message	Code	Reason	Action
Main Line		3999b	SYSLOG has not been assigned. The program enters the wait state. This message will be found in bytes 0-4 of the console.	The program will not proceed. Reload the program with corrected control cards.
	CARD READ WAS NOT INITTP		The first card read was not the initialize tape control card.	
	NO TAPES ASSIGNED		A SYS000 was not assigned.	
	SERIAL NOT PUNCHED		The utility modifier card must contain SERIAL when the card option is not specified.	
	SERIAL NO. MISSING		The beginning serial number was not indicated in the utility modifier card when the card option is not specified.	
	CODE NOT PUNCHED		CODE has not been entered when the card option is not specified.	

Figure 20. Initialize Tape Error Messages (Both Options)

Routine	Message	Reason	Action
Main Line	SEQUENCE ERROR DETECTED	A volume image card was out of sequence. This group of volume image cards will not be written on the tape.	None. See the following message.
	ABOVE VOL CARDS DID NOT PROCESS	The group of volume image cards out of sequence were not written on the tape. The tapes to be initialized by these volume image cards are bypassed and processing is done on the next set of volume image cards.	Initialize the bypassed tapes in another program run.
	INCORRECT CARD	A card was read that was not a VOL or END card. The job is terminated.	Reload the Program with the corrected control cards (processing will again begin with SYS000).

Figure 21. Initialize Tape Error Messages (Card Image Option)

Routine	Message	Reason	Action
Main Line	PASS xx OF TAPES ASSIGNED	Before each pass of the assigned tape drives the number of the pass is indicated.	Processing continues without operator intervention.
	SYS xxx (000,001,...,015)	The symbolic unit is printed prior to the printing of volume label images for each tape unit.	
	VOL1 nnnnnnn	After each pass of the assigned tape drives the VOL1 followed by the serial number and protection indicator is printed for each tape initialized (not card image option).	
	VOLn xxxxxxxxxxx	After each pass of the assigned tapes the card image of each volume image card is printed (card image option only).	
	END OF JOB	a) Card image option - printed after the last card has been processed. b) No card image option - printed when the rewind option is specified and the tape on the last unit has been processed.	

Figure 22. Initialize Tape, Execution Logging Messages

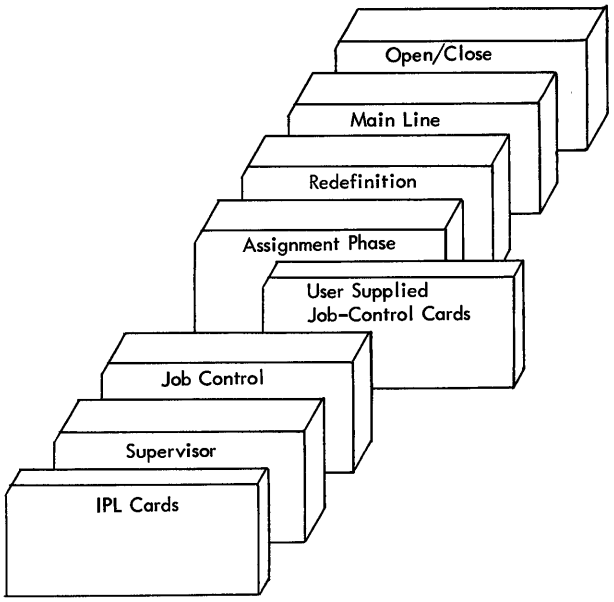

Figure 23. Program Object Deck and Control Card Inserts

Type of Control Card	Function
Job Control	
1. JOB	Required to define utility program.
2. ASSGN	Required for I/O unit assignments.
3. DATE	Required for all programs.
4. UPSI	Not used.
5. CONFG	Gives system configuration for programs. If CONFG card is absent, 8192 positions of main storage is assumed.
6. LOG or NOLOG	Optional, but if used, it must follow the SYSLOG assignment card.
7. EXEC	Required
Utility Control	Utility modifier information is entered through the IBM 1052 Printer-Keyboard.

Figure 25. Respective Order of Control Cards

Multiple Utility Program Phases	Utility Program Ident. Number cols. 73-76	Sequence No. cols. 77-80
IPL	A055	nnnn
Supervisor	B055	nnnn
Job Control	C055	nnnn
Assignment Phase	D055	nnnn
Redefinition	D055	nnnn
Main Line	D055	nnnn
Open/Close	D055	nnnn

Figure 24. Program Deck Identification Numbers

ASSIGNMENT PHASE

The Multiple Utility program provides for:

- Three utility operations (functions) performed simultaneously, or
- Two utility operations performed simultaneously, or
- A single utility operation.

The choice of operations that can be performed are:

- Card to Tape
- Tape to Card
- Tape to Printer

Depending upon the available I/O devices and system control assignment (job control), any combination of operations can be assigned (e.g. three tape to printer operations can be assigned if appropriate I/O devices are available). As operations are assigned to the program (Assignment Phase of the program), they are designated as A, B, or C in that order. Following program loading, the program goes to the assignment phase of the program and control is given to the operator.

Figure 26 gives the messages printed and the action that must be taken during the assignment phase of the program. If additional operating instructions are needed, see Figure 5. If additional message information is needed, see Figure 6.

Routine	Message	Code	Reason	Action
Program Loading		3999b	No ASSGN card (SYSLOG) was given for the 1052. Therefore, the console takes this message in bytes 0-4. The program remains in the wait state.	Put in an ASSGN card for the 1052 (SYSLOG) and reload the program.
		2300A	Invalid hexadecimal code in a REP card being loaded.	Correct card code and replace before the remainder of the deck.
Any routine		0cuu xxxxA	The first message gives the channel (c) and unit (uu) number of the device. The second message (if 1052 is inoperative, the console START and INTERRUPT must be pressed to get this message) means a channel or device error has occurred. See Figure 7 for the meaning of xxxxA; however, if the device is a 1403, 1443 or 1404, the 'Action' in the Printer Error Routine (found below) applies.	The operator may: (1)Key in '4' to continue, (2)Key in '5' to retry, (3)Key in '6' to terminate the operation, and (4)Key in '7' to bypass the operation in progress until the designated unit is ready. If this reply is outstanding, no operation can be brought to an end-of-job condition until the unit is made ready. The printer must be ready to begin any printer operation for this option to hold.
		0cuu 3F3FA	The first message is as above. The second message indicates that the unit is not available.	
Printer Error (tape-to-printer operation)		0cuu 0F20A 0cuu 8000A	These two messages will occur if the invalid first-character forms control has been supplied for Type A (TA) forms control.	(1)Key in a '4' to go to the next record (2)Key in a '5' to retry the same record *(3)Key in a '6' or '7' to terminate the job.
		0cuu 4000A	The 1403, 1443 or 1404 requires intervention, but the operator action depends upon the status of the device.	(1)Key in a '5' to continue processing. *(2)Key in a '6' to terminate the job. *(3)Key in a '7' to bypass the operation in progress until the designated unit is ready. If this reply is outstanding, no operation can be brought to an end-of-job condition until the unit is made ready. The printer must be ready to begin any printer operation for this option to hold. Note: A reply of '4' to continue processing may cause a record to be lost.
		0cuu 1000A	Any equipment check occurred on the 1403, 1443 or 1404.	(1)Key in a '4' or '5' to continue processing. *(2)Key in a '6' or '7' to terminate the job.
		0cuu 0800A	A data check occurred when an attempt was made to print a character that had not been loaded into the Universal Character Set (UCS) printer buffer.	(1)Key in a '4' or '5' to continue. *(2)Key in a '6' or '7' to terminate the operation. *Note: A '6' or '7' reply may have to be repeated to obtain the indicated action. This depends upon the number of requests for I/O in the queue at the time the error occurred.
Punch Error (2540)		0cuu 0700A	Punch check error. A new card cannot be generated by a retry option. The card in error is the last card in the stacker. The card that follows is not checked and could also be in error.	Key in a '5' to continue processing.

▶Figure 26. Assignment Phase Messages (Part 1 of 3)

Routine	Message	Code	Reason	Action
Assignment Phase	ENTER PROGRAM ASSIGNMENT		This message occurs after the assignment phase is loaded. The program issues a read command to the 1052 so that control can be given to the operator to assign the operations to be performed.	The operator must enter the program assignment, PRG=(nn,nn,nn). The values of nn are: TP for tape to printer CT for card to tape TC for tape to card NA for any operation not assigned. All upper case letters must be used. Examples: PRG=(CT,TP,TC) PRG=(TC,TC,NA) PRG=(NA,NA,TP)
	NO PRG IDENTIFICATION		The letters PRG were not found in the first three characters of the program assignment.	None. Wait for REENTER PROGRAM ASSIGNMENT to be printed and enter the correct assignment.
	= SIGN NOT PRESENT		No equal sign following PRG	
	(NOT PRESENT		Left hand parenthesis following equal sign is missing.	
	NO COMMA BETWEEN A AND B ENTRY		The comma between the A and B entry is missing from the program assignment.	
	xx IS NOT A VALID ENTRY FOR A, B, C		The entry for operation A, B, or C was other than TP, CT, TC, NA.	
	NO COMMA BETWEEN B AND C ENTRY		The comma between the B and C entry is missing from the program assignment.	
	) NOT PRESENT		No righthand parenthesis follows entry C.	
	REENTER PROGRAM ASSIGNMENT		This message follows all error messages due to wrong entry of PRG=(A,B,C). It indicates a read command was issued to the 1052.	Reenter program assignment PRG=(A,B,C).
	FUNCTION x DOES NOT HAVE PROPER UR DEVICE		The unit record (UR) device type was not L1 for TP L2 for TP R1 for CT R3 for CT or TC R4 for CT P2 for TC P1 for TC for this operation (x)	None. The program proceeds to diagnose other assignment errors.
	NO BASIC TAPE FOR FUNCTION x HAS BEEN ASSIGNED		No assign card for basic tape for this operation (x)	
	BASIC TAPE ASSIGNED TO FUNCTION x HAS WRONG DEVICE TYPE		Device type for basic tape was not T1 or T2 for this operation (x)	
	ALTTAPE ASSIGNED TO FUNCTION x HAS WRONG DEVICE TYPE.		Device type for the alternate tape was not T1 or T2 for this operation (x).	
	TAPE I/O AREA STARTS AT LOCATION xxxxx		Save areas have been assigned for header label and page heading line. The first free position after the save area is the starting location of the tape I/O area.	

● Figure 26. Assignment Phase Messages (Part 2 of 3)

Routine	Message	Code	Reason	Action
	DUE TO ERRORS IN THE ASSIGN CARDS THE JOB IS TERMINATED-CORRECT AND RELOAD		This message is printed following the logging of the preceding ASSGN card errors. The program enters the wait state state.	Correct the previously logged errors and reload the program.
	SYSxxx AND SYSxxx HAVE SAME DEVICE ASSIGNED FUNCTIONS A B C CANNOT BE RUN AT THE SAME TIME		The same channel and unit address appears in more than one SYSxxx entry. This is permitted for the basic tape and alternate tape belonging to the same operation. Otherwise, if the following message occurs, it indicates which operations have the identical system devices assigned. Attempts to run these operations in combination will cause unpredictable results. Any combination of two or more of A, B, or C may occur.	None. The program will proceed at the operator's discretion if all the conditions have been satisfied.

● Figure 26. Assignment Phase Messages (Part 3 of 3)

REDEFINITION PHASE

Following the assignment phase, the second phase of the program is loaded, and the messages WAIT and TYP are printed. A read is then issued to the IBM 1052 Printer-Keyboard to allow an entry to be issued. Valid entries are:

- STARTfb
- ENDfb
- FP
- CP
- Hb

The START entry defines and activates the operations assigned (A,B,C). Only those operations assigned at this time can be activated during the running of the program. The following are the START entry formats.

Tape to Printer
STARTfbTt,A=(n,m),F=(x,y,z),Rr,Ss,Pp,Lx

Card to Tape
STARTfbA=(n,m),F=(x,y,z),Rr,Cc,Lx

Tape to Card
STARTfbA=(n,m),F=(x,y,z),Rr,Cc,Lx

Entry	Explanation
STARTf	Identifies the operation to be started (f=A,B or C)
b	Indicates one blank space
Tt	Indicates the first-character forms-control for tape-to-printer (t=A,B,C or L) Type A - System/360 printer command code. Type B - the d-modifier character of the IBM 1401 carriage control instruction used for printing a line with a 1401 system. Type C - allows single, double, triple, and suppressed spacing and skipping after printing to channels 1-9. Type L - indicates that records are to be listed and there is no first-character forms-control.
A=(n,m)	Indicates input record size n = record size (bytes required) m = block size (in bytes)
F=(x,y,z)	Defines a field to be selected. When a binary field is to be selected, it must be referred to and selected from as it appears in main storage and not as it appears on a card (e.g. 40 card columns of binary require 80 positions of main storage). x = starting location of the field in the input record as it appears in main storage. y = the length of the field to be selected. z = starting location of the field in the output record as it appears in main storage.
Rr	Defines further information about the tape. r = U to rewind and unload R to rewind and not unload N do not rewind and unload M multiple reel tapes are to be handled.
Cc	Defines card I/O information c = 1 EBCDIC 2 binary.
Lx	Defines the label option x = Y labels are present or are to be written N labels are not present or are not to be written.
Pp	Defines the page number option p = Y print page numbering N suppress page numbering.
Ss	Defines spacing between records s = 1 single 2 double 3 triple.

Note: The last card read from a 1442, for a card-to-tape operation, is not ejected. Consequently, it is recommended the cards be run out before using the same device for a subsequent operation.

The END entry is entered in the following formats:

ENDA ENDB ENDC	These entries cause the operation named to be terminated (A,B,C).

The FP entry is entered:

FP	This entry causes the program to terminate all active operations.

The CP entry is entered:

CP	This entry causes the program to execute the current jobs.

The Hb entry is entered:

Hb	When the read that follows a start command is issued to the printer-keyboard, a heading line can be entered for the function being initiated. The heading-line cannot be longer than 100 characters. This option is valid for the tape-to-printer operation only if first-character forms control is <u>not</u> specified.

The program can be interrupted at any time during processing of the main line or the printing of input (or output) tape header labels and tape input trailer labels by pressing the printer-keyboard request key. When the program is interrupted by the request key, all blocks presently in storage will be processed. This will result in reading and punching of as many cards (or printing of as many lines) as there are records left in all tape areas.

<u>Note</u>: At the completion of each entry, an end-of-block character must be entered. The end-of-block is entered on the 1052 by holding the ALTN CODING key down and pressing the "5" key.

Figure 27 gives the messages printed and the action that must be taken during the Redefinition phase of the program.

Routine	Message	Reason	Action
Main Line	WAIT	This preliminary message is printed after the first phase of the program is loaded or when all operations are terminated. The program continues and the TYP message follows.	No operator action.
Redefinition Phase	TYP	A read command is issued to the 1052 so that an entry from the Printer-Keyboard can be accepted. Valid entries are: STARTfb (followed by parameters) ENDfb FP CP Hb (followed by a heading line)	Type the desired entry. When the entry is complete, enter an end-of-block character.
	xxxxxxunwanted dataxxxxxxxxxxx xxxxxxxxxxxxx xxxxxxxxxxx...	If unwanted data is printed on the 1052 during the: a. Open routine - No tape mark precedes the data on labeled tape. b. Close routine - No EOF record, or tape-mark follows the tape-mark after the data for labeled tape. This does not apply if LN (no labels) has been specified.	Press the 1052 REQUEST key (if during the close routine the message RQCLS will follow).
	x FIN	Operation x has been set out of process by an END or FP entry, or it was out of process when END or FP command was given.	None. The program executes the rewind option for input tapes and/or writes EOV trailer for output tapes.
	x IN PROCS	The program logs the operation(s) in process.	None. The program assigns a tape I/O area for each operation.
	HCR xxxxx	xxxxx is the highest main storage position assigned to tape I/O areas. This message occurs after assigning a tape area to every operation in process.	None. The program checks to see if it can assign a second tape I/O area to every operation in process so that faster processing may result.
	INV COM	Operation identification (A, B, or C) or command, or both, are wrong. The program issues a new read command to the 1052.	Reenter function or command. Valid entries are: STARTfb ENDfb FP CP Hb f must be A, B, or C.
	STx NO —	An attempt has been made to start an operation which is running or has not been assigned during program assignment. The program issues a new read command to the 1052.	Enter the function or command. See Action Column under INV COM.
	ASUMD VAL	No parameters were given with the START command. Assumed values are taken, and the program checks core requirements.	None.
	PAR x INV	The parameter identification for x is invalid	None. The program proceeds to diagnose the remaining parameters.
	INV BLA	Blank between parameters.	

Figure 27. Redefinition Phase Messages (Part 1 of 2)

Routine	Message	Reason	Action
	PAR x SNT	Equal sign, parentheses, or comma(s) missing from the parameter formats, A=(n,m) or F=(x,y,z). Otherwise, commas do not follow the remaining parameters.	
	PAR x VLU	For the parameter formats, A=(n,m) or F=(x,y,z), either the variables n,m,x,y, or z are not numeric, missing, or are zero.	
	UR-SIZ EX	Tape record size exceeds the printer, or punch, or reader device capacity. Field select was not applied or was applied incorrectly.	
	REC SIZ EX	Specified tape record size capacity exceeded. Field select was not applied or applied correctly.	
	COR EXC	The required I/O area is not available for the last function started.	
	REC BL SZ	Block size specified is not a multiple of the record size.	
	x OPN	No errors diagnosed. Operation x (A, B, or C) has been started and the files have been opened. A read command is then issued to the 1052.	Enter the desired command.
	DIAG ER	Errors were diagnosed. Operation x (A, B, or C) has not been started. A read command is issued to the 1052.	
	NO TP	A heading line was entered for an operation that was not tape to print. A read command is issued to the 1052.	

● Figure 27. Redefinition Phase Messages (Part 2 of 2)

Note: If a second tape-mark is not present after the trailer label, the program will type the first 80 characters of each tape record until a tape-mark is reached or until the operator presses the 1052 REQUEST. Pressing the REQUEST will terminate the function:			
Routine	Message	Reason	Action
Open/Close	NO VOL 1	Labels on output tape requested but given tape has no VOL 1 Label. The operation will not be started.	Provide a new tape and reenter the operation.
	NO HDR 1	Labels were requested on the output tape for the card to tape program but no HDR 1 card was provided. The operation will not be started.	Provide the HDR1 card and reenter the operation.
	3XPDA	Tape defined as output has not expired. The program will not continue without a response.	Type 8 for accept. Type 9 for reject and mount a new reel.
	(A list of header labels is typed).	Header labels that are present are typed.	Read and check the labels printed.
	(A list of trailer labels is typed).	Trailer labels that are present are typed.	Read and check the labels printed.
	xxxxxx	Accumulated block count with preceding zeros is printed.	Read and check against the trailer labels, if present.
	3x00A	An unlabelled tape-to-printer or tape-to card job with parameter RM given has reached end-of-reel condition. x means operation A, B, or C. The program waits for a reply.	1) Key in 'N' to indicate more tape reels. The operation will continue. 2) Key in 'Y' to indicate no more tape reels. The operation will be terminated.
	NOPEN	An uncorrectable tape error, or tape unit failure has occurred while opening a file. The operation is automatically terminated and the DIAG ER and TYP messages follow.	The operator may correct the situation and restart the operations with the TYP message responses.
	RQCLS	The 1052 REQUEST has been pressed during the close routine to terminate typing of unwanted information. The operation is terminated as if the EOF record, or tape-mark, had been found.	No operator action.

Figure 28. Open/Close Phase Messages

1. The program is loaded using the IPL procedure.

2. If a read error is detected while loading in any of the overlays of this program, the wait state is entered, and the program must be reloaded.

3. The address of the printer to be used must be punched as follows, and placed in the absolute object deck after the third card of the storage-print program:

Column	Entry
1	Channel number (e.g. channel 0 - punch 12, 0, 9, 8, 1 in column 1).
2	Unit number (e.g. X'10' - punch 12, 11, 9, 8, 1 in column 2). Figure 29 lists the character sets for punching these numbers.

Decimal	Hexa-Decimal	Character Set Punch Combination	Decimal	Hexa-Decimal	Character Set Punch Combination
0	00	12,0,9,8,1	65	41	12,0,9,1
1	01	12,9,1	66	42	12,0,9,2
2	02	12,9,2	67	43	12,0,9,3
3	03	12,9,3	68	44	12,0,9,4
4	04	12,9,4	69	45	12,0,9,5
5	05	12,9,5	70	46	12,0,9,6
6	06	12,9,6	71	47	12,0,9,7
7	07	12,9,7	72	48	12,0,9,8
8	08	12,9,8	73	49	12,8,1
9	09	12,9,8,1	74	4A	12,8,2
10	0A	12,9,8,2	75	4B	12,8,3
11	0B	12,9,8,3	76	4C	12,8,4
12	0C	12,9,8,4	77	4D	12,8,5
13	0D	12,9,8,5	78	4E	12,8,6
14	0E	12,9,8,6	79	4F	12,8,7
15	0F	12,9,8,7	80	50	12
16	10	12,11,9,8,1	81	51	12,11,9,1
17	11	11,9,1	82	52	12,11,9,2
18	12	11,9,2	83	53	12,11,9,3
19	13	11,9,3	84	54	12,11,9,4
20	14	11,9,4	85	55	12,11,9,5
21	15	11,9,5	86	56	12,11,9,6
22	16	11,9,6	87	57	12,11,9,7
23	17	11,9,7	88	58	12,11,9,8
24	18	11,9,8	89	59	11,8,1
25	19	11,9,8,1	90	5A	11,8,2
26	1A	11,9,8,2	91	5B	11,8,3
27	1B	11,9,8,3	92	5C	11,8,4
28	1C	11,9,8,4	93	5D	11,8,5
29	1D	11,9,8,5	94	5E	11,8,6
30	1E	11,9,8,6	95	5F	11,8,7
31	1F	11,9,8,7	96	60	11
32	20	11,0,9,8,1	97	61	0,1
33	21	0,9,1	98	62	11,0,9,2
34	22	0,9,2	99	63	11,0,9,3
35	23	0,9,3	100	64	11,0,9,4
36	24	0,9,4	101	65	11,0,9,5
37	25	0,9,5	102	66	11,0,9,6
38	26	0,9,6	103	67	11,0,9,7
39	27	0,9,7	104	68	11,0,9,8
40	28	0,9,8	105	69	0,8,1
41	29	0,9,8,1	106	6A	12,11
42	2A	0,9,8,2	107	6B	0,8,3
43	2B	0,9,8,3	108	6C	0,8,4
44	2C	0,9,8,4	109	6D	0,8,5
45	2D	0,9,8,5	110	6E	0,8,6
46	2E	0,9,8,6	111	6F	0,8,7
47	2F	0,9,8,7	112	70	12,11,0
48	30	12,11,0,9,8,1	113	71	12,11,0,9,1
49	31	9,1	114	72	12,11,0,9,2
50	32	9,2	115	73	12,11,0,9,3
51	33	9,3	116	74	12,11,0,9,4
52	34	9,4	117	75	12,11,0,9,5
53	35	9,5	118	76	12,11,0,9,6
54	36	9,6	119	77	12,11,0,9,7
55	37	9,7	120	78	12,11,0,9,8
56	38	9,8	121	79	8,1
57	39	9,8,1	122	7A	8,2
58	3A	9,8,2	123	7B	8,3
59	3B	9,8,3	124	7C	8,4
60	3C	9,8,4	125	7D	8,5
61	3D	9,8,5	126	7E	8,6
62	3E	9,8,6	127	7F	8,7
63	3F	9,8,7	128	80	12,0,8,1
64	40	(blank)			

Figure 29. Character Set Punch Combinations (Part 1 of 2)

Decimal	Hexa-Decimal	Character Set Punch Combination	Decimal	Hexa-Decimal	Character Set Punch Combination
129	81	12,0,1	193	C1	12,1
130	82	12,0,2	194	C2	12,2
131	83	12,0,3	195	C3	12,3
132	84	12,0,4	196	C4	12,4
133	85	12,0,5	197	C5	12,5
134	86	12,0,6	198	C6	12,6
135	87	12,0,7	199	C7	12,7
136	88	12,0,8	200	C8	12,8
137	89	12,0,9	201	C9	12,9
138	8A	12,0,8,2	202	CA	12,0,9,8,2
139	8B	12,0,8,3	203	CB	12,0,9,8,3
140	8C	12,0,8,4	204	CC	12,0,9,8,4
141	8D	12,0,8,5	205	CD	12,0,9,8,5
142	8E	12,0,8,6	206	CE	12,0,9,8,6
143	8F	12,0,8,7	207	CF	12,0,9,8,7
144	90	12,11,8,1	208	D0	11,0
145	91	12,11,1	209	D1	11,1
146	92	12,11,2	210	D2	11,2
147	93	12,11,3	211	D3	11,3
148	94	12,11,4	212	D4	11,4
149	95	12,11,5	213	D5	11,5
150	96	12,11,6	214	D6	11,6
151	97	12,11,7	215	D7	11,7
152	98	12,11,8	216	D8	11,8
153	99	12,11,9	217	D9	11,9
154	9A	12,11,8,2	218	DA	12,11,9,8,2
155	9B	12,11,8,3	219	DB	12,11,9,8,3
156	9C	12,11,8,4	220	DC	12,11,9,8,4
157	9D	12,11,8,5	221	DD	12,11,9,8,5
158	9E	12,11,8,6	222	DE	12,11,9,8,6
159	9F	12,11,8,7	223	DF	12,11,9,8,7
160	A0	11,0,8,1	224	E0	0,8,2
161	A1	11,0,1	225	E1	11,0,9,1
162	A2	11,0,2	226	E2	0,2
163	A3	11,0,3	227	E3	0,3
164	A4	11,0,4	228	E4	0,4
165	A5	11,0,5	229	E5	0,5
166	A6	11,0,6	230	E6	0,6
167	A7	11,0,7	231	E7	0,7
168	A8	11,0,8	232	E8	0,8
169	A9	11,0,9	233	E9	0,9
170	AA	11,0,8,2	234	EA	11,0,9,8,2
171	AB	11,0,8,3	235	EB	11,0,9,8,3
172	AC	11,0,8,4	236	EC	11,0,9,8,4
173	AD	11,0,8,5	237	ED	11,0,9,8,5
174	AE	11,0,8,6	238	EE	11,0,9,8,6
175	AF	11,0,8,7	239	EF	11,0,9,8,7
176	B0	12,11,0,8,1	240	F0	0
177	B1	12,11,0,1	241	F1	1
178	B2	12,11,0,2	242	F2	2
179	B3	12,11,0,3	243	F3	3
180	B4	12,11,0,4	244	F4	4
181	B5	12,11,0,5	245	F5	5
182	B6	12,11,0,6	246	F6	6
183	B7	12,11,0,7	247	F7	7
184	B8	12,11,0,8	248	F8	8
185	B9	12,11,0,9	249	F9	9
186	BA	12,11,0,8,2	250	FA	12,11,0,9,8,2
187	BB	12,11,0,8,3	251	FB	12,11,0,9,8,3
188	BC	12,11,0,8,4	252	FC	12,11,0,9,8,4
189	BD	12,11,0,8,5	253	FD	12,11,0,9,8,5
190	BE	12,11,0,8,6	254	FE	12,11,0,9,8,6
191	BF	12,11,0,8,7	255	FF	12,11,0,9,8,7
192	C0	12,0			

Figure 29. Character Set Punch Combinations (Part 2 of 2)

APPENDIX A: PRINTER-KEYBOARD ASSIGNMENT

If the system does not have an IBM 1052 Printer-Keyboard at the fixed address X'001F', a replace card (REP) must be inserted between the supervisor and job control of the program deck. Otherwise, message codes normally printed on the 1052 will be found in bytes 0-4, and must be displayed from the console.

Depending upon the type of utility program, the replace card is punched as follows:

1. For the Single Transfer Utility Programs, the first column of the card contains a 12-2-9 multiple-punch and is immediately followed by REPbb0000E4bbbb0cuu (b indicates one blank space and cuu indicates the channel "c" and unit "uu" address of the device).

2. For the Special Utility Programs (disk), the first column of the card contains a 12-2-9 multiple-punch and is immediately followed by REPbb0002BEbbbb0cuu.

The Initialize Tape and Multiple Utility Program assign the 1052 from SYSLOG so there is no need for a replace card.

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File No. S360-32

Re: Form No. C24-3392-3

This Newsletter No. N24-5030

Date: January 10, 1966

Previous Newsletter Nos. N24-5014

Replacement pages for IBM System/360 Basic Programming Support Operating Guide: Utility Programs, Form C24-3392-3

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7 and 8
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Form	Modified Pages	Date
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