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IBM 1410 Input/Output Control System
for Card and Tape Systems
Operator's Guide

This publication contains the messages originated
by the card and tape routines of the 1410 IOCS when
an error condition occurs or when an inquiry request
is made from the console. Most of the messages
offer the operator various options for proceeding
with the run. These options are explained, as is
the procedure used in restarting a program from a
checkpoint.

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put Control System for Card and Tape Systems,
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Operator Options for Error Conditions

Several of the error messages offer more than one option for corrective procedure. The options are chosen by pressing the Inquiry Request Key, entering code words through the console typewriter, and pressing the Inquiry Release Key. The corrective actions represented by the code words are as follows:

RETRY   - The IOCS will again attempt to execute the operation that caused the error.

SKIP   - The IOCS will ignore the operation that caused the error and will read the next record or block of records.

PROC   - The IOCS will ignore the error and resume processing as if the operation had been executed successfully.

ACCEPT   - The IOCS will ignore the error. (This option is offered for errors caused by tape labels.)

DUMP   - The IOCS will write the record that contains the error onto the output error file. After writing the record on that file, the IOCS will again enter a waiting loop and write the same error message, enabling the operator to continue processing with another option. (This option is offered only if an output error file was designated by a DIOCS "READERROR" entry containing both the "SCAN" and "TAPE,1Y" operands.)

*SCAN   - The IOCS will type the location(s) of the asterisk(s) in the record. After typing the location(s), the IOCS will again enter a waiting loop and write the same message,

enabling the operator to continue processing with another option. (This option is offered only if the DIOCS "READERROR" entry contains the operand "SCAN.")

NOTE: Several of the error messages include the I/O instruction that resulted in the error condition. Error messages for read-tape operations also include the length of the record in which the error occurred. These parts of the message are designated in the following list by "(I/O Op)" and "(R/L)." The end-of-reel and label-error messages include the channel and unit number of the tape, indicated in the following list by "(cu)."

Operator Options for Console Inquiries

The three following options are offered when an inquiry request is made from the console and no DIOCS "INQUIRY" entry was written for the program. (That is, the programmer has not written a routine that processes console inquiries.) The options are chosen by entering the code word (or address) and pressing the Inquiry Release Key.

Before the IOCS recognizes such an inquiry request, it clears all channels, saves the status of the compare indicators and the zero balance indicator, and saves the location of the instruction that was interrupted by the console inquiry.

START   - The IOCS will restore the status of the indicators and return control to the instruction that was interrupted by the console inquiry.

CHKPT   - The IOCS will cause a checkpoint to be taken and will then return to the inquiry-request waiting loop. The operator then has the choice of terminating the run or resuming it (by using the START option).

XXXXX   - "XXXXX" can be any valid storage address (indexing is permitted). The IOCS will branch to this location. (See the following NOTE for the procedure for returning control to the IOCS.)

NOTE: When the IOCS recognizes a console inquiry, it writes a Resumption Address on the console typewriter. By manually branching to this address, the operator can return control to the IOCS routine that restores the status of the indicators and returns control to the interrupted program. (This procedure would be used, for example, if operator action--such as pressing Computer Reset--altered the status of the indicators.) The user may also make a programmed return to the Resumption Address. (The label for this location is IOCSRESUME.) For example, if the XXXXX option is used, the last instruction in the routine that starts at location XXXXX can be a branch to IOCSRESUME.

Message Identification Numbers

The five digits that precede messages written by the IOCS are an identification number. The following standards apply to these five digits:

Ten Thousands' Position
1 - No waiting loop.
2 - Waiting loop with one option for operator procedure.

Ten Thousands' Position
3 - Waiting loop with two options for operator procedure.
4 - Waiting loop with three options for operator procedure.
5 - Waiting loop with four options for operator procedure.
6 - Waiting loop with five options for operator procedure.

Thousands' Position
0 - Indicates that this is a message given by an IBM program.

Hundreds' Position
1 - Indicates that this is an IOCS message.

Tens' and Units' Positions
xx - A number from 00 to 99 that makes each identification number unique.

Table of Messages

Following is a list of the messages originated by the 1410 Card/Tape IOCS. Explanations and operator procedures for each message are included.

Message	Explanation	Operator Procedure
1Ø1ØØ NR (I/O Op)	Input/Output device is not ready.	Place device in Ready status. (Program will automatically resume when device is Ready.) NOTE: If this message is given because a tape unit is set to a wrong number, the tape unit must not be in a Ready status while the dial is being set to the correct number.
1Ø111 DCK (I/O Op) (R/L)	Data Check error condition on a read-tape operation. (The IOCS attempted to read the record twenty times, but the error persisted. The IOCS has written the record on the output error file, as specified by the operand of the DIOCS "READERROR" entry.)	None. (The IOCS does not enter a waiting loop for operator action.)
1Ø314 TIE (cu) bc rc ht (*) bc rc ht (**)	Trailer Label In Error. ("bc" is the block count, "rc" is the record count, "ht" is the hash total.) Record counts and hash totals are given only if specified by the DIOCS "COUNTS" entry. Block counts are always given. (*) This line is taken from the trailer label. (**)This line is accumulated by the IOCS.	None. (The IOCS does not enter a waiting loop for operator action.)

Message	Explanation	Operator Procedure
1∅185 CPT ccc	The IOCS has taken a checkpoint. "ccc" is the accumulated count of checkpoints taken since the start of the program.	None. (The IOCS does not enter a waiting loop for operator action.)
2∅114 DCK (I/O Op)	Data Check error condition on a write-tape operation. (The IOCS first back-spaced the tape and attempted to re-write the record, but the error persisted. The IOCS then performed a backspace-skip-rewrite sequence twenty times. The record could still not be successfully written.)	The only possible option for a tape output error is to attempt the write operation again. This option is assumed by the IOCS if the operator presses Inquiry Request and then Inquiry Release. (No code word is necessary.)
2∅115 LLC (I/O Op)	The last line printed or the last card punched contained an error.	The IOCS cannot re-print or re-punch records containing an error. To resume program execution, press Inquiry Request and then Inquiry Release. (No code word is necessary.)
2∅116 DCK (I/O Op)	Data Check error condition on a unit-record operation. (The IOCS has tried the operation two times, but the error persists.)	The only possible option is to attempt the operation again. This option is assumed by the IOCS if the operator presses Inquiry Request and then Inquiry Release. (No code word is necessary.)
2∅117 ZRL (I/O Op)	Zero record length. (The first character of an output area for a write-tape operation is a group mark with word mark.)	PROC
● 20118 NLR	Ten consecutive noise records have been encountered.	Press Inquiry Request and Inquiry Release to continue.
2∅12∅ EOR (cu)	Input or output end-of-reel condition. (This message is given only for files that have not been assigned an alternate tape unit.)	Mount the next reel, press Inquiry Request and then Inquiry Release.
2∅136 RLN	The RDLIN macro-instruction was executed, but the card read by the IOCS was not recognized as a label card (i.e., columns 16-20 did not contain "RDLIN").	Place a label card in the card reader. Press Inquiry Request and then Inquiry Release. (The RDLIN will be re-executed.)
2∅143 STK (I/O Op)	No Transfer error on a read-card operation. (This is a programming error in the object program. See the 1410 machine manual.)	To cause the IOCS to ignore the error and continue processing, press Inquiry Request and then Inquiry Release.
2∅144 WLR (I/O Op)	Wrong-Length-Record error condition on a unit-record operation.	The only possible option is to try the operation again. This option is assumed by the IOCS if the operator presses Inquiry Request and then Inquiry Release. (No code word is necessary.)

Message	Explanation	Operator Procedure
2ø183 CI (*)	The last information entered through the console was invalid or cancelled by the operator. (*) In some cases, the information written in this area of the previous IOCS message, for example "(I/O Op)", is still in storage and is re-written with this message. This can be helpful in locating the previous IOCS message in order to determine what the correct console entry should have been.	Press Inquiry Request, enter the correct information, and then press Inquiry Release.
2ø186 RST	The IOCS has made the program ready for restarting (from a checkpoint). This waiting loop allows the operator to perform additional "setups," if any are required.	To begin execution at the restart point, press Inquiry Request and then Inquiry Release.
3ø132 FIL (cu) (*) (**)	The header label indicates that this is not the correct input tape. (*) The file serial number, reel sequence number, file name, and the creation date from the header label. (**) The above information as specified by the DTF entries.	1. RETRY (After mounting the correct input tape.) 2. ACCEPT
3ø133 NIH (cu)	No input header label found by the IOCS.	1. RETRY 2. ACCEPT (This means the IOCS will accept the first tape record as a "false" header label and treat the next tape record as the first data record. Therefore, if the tape actually does not contain a header label, the operator must rewind the tape to load point.)
3ø181 HLT xxxxx or 4ø182 HLT xxxxx(*)	The IOCS is ready to accept information through the console. All channels are free. ("xxxxx" is the Resumption Address.) (*) This message is given if a DIOCS "CHECKPOINT" entry was written for the program. NOTE: See "Operator Options for Console Inquiries."	1. START 2. CHKPT (This option can be used only when the 4ø182 message is given.) 3. XXXXX
4ø11ø DCK (I/O Op) (R/L)	Data Check error condition on a read-tape operation. (The IOCS attempted to read the record twenty times, but the error persisted.)	1. RETRY 2. SKIP 3. PROC
• 40119 LRE	Error encountered while reading a tape label.	SKIP PROC RETRY

Message	Explanation	Operator Procedure
4Ø13Ø NOH (cu)	No output header label found by the IOCS.	1. RETRY 2. ACCEPT (This means the IOCS will accept the tape as unlabeled and therefore cannot check the date or retention cycle.) 3. The operator may key the date through the console (yyddd format, where yy is the year and ddd is the day). The IOCS will move the date to storage positions 115-119 and will automatically RETRY the header label check. (Although this option is not a <u>corrective</u> procedure, it is offered to enable the operator to store the current date through the console, in the event the date was not loaded by card. This option also insures that the new output header labels will have the correct date.)
4Ø131 DAT (cu)	Date or retention cycle on the header label of an output tape indicates the present tape records should not be destroyed.	1. RETRY (After mounting a "scratch" tape.) 2. ACCEPT 3. The same as option 3 for the preceding message (4Ø13Ø NOH). (This option is offered to cover the possibility that the absence of a date in locations 115-119 caused this message to be given. It also prevents the creation of header labels with blank date fields. Tapes with such a label will always be treated by the IOCS as "scratch" tapes.)
4Ø182 HLT	See 3Ø181 HLT.	
5Ø112 DCK (I/O Op) (R/L)	Data Check error condition on a read-tape operation. (The IOCS attempted to read the record twenty times, but the error persisted.)	1. RETRY 2. SKIP 3. PROC 4. *SCAN
6Ø113 DCK (I/O Op) (R/L)	As above.	1. RETRY 2. SKIP 3. PROC 4. *SCAN 5. DUMP

CHECKPOINT - RESTART PROCEDURE

When a checkpoint is taken, a message is typed on the console giving the number of the checkpoint record just completed. The message format is CPT XXX--the three Xs representing the checkpoint record number. This number must be entered on the Restart Program control card.

Restart

To restart a program at the selected checkpoint, a control card prepared in the format shown must be placed in the card reader immediately following the Restart program deck. The Restart program reads in the control card and utilizes the information which it contains to initialize instructions and obtain the correct checkpoint control record.

If the machine configuration does not include a 1402 card reader, the following procedure is necessary:

Replace the END RSTART card at the end of the Restart deck with an END RSTYPM card. Assemble the deck and place the Restart program on tape. Load the Restart program. At the beginning of the Restart program, the message "PRESS INQ REQ AND ENTER RSTRT CNTRL REC" will be typed on the console typewriter. Press the Inquiry Request key, enter the Restart control record as specified under the control card format, and press Inquiry Release.

If the files have standard labels, a message is typed on the console printer for each file. The message states the file name, file serial number, the reel sequence number, the channel, and the drive number of each file that should be mounted at this time. There is a programmed waiting loop to allow for the proper tapes to be mounted. The following message accompanies this waiting loop: "WHEN TAPES MOUNTED, PRESS INQ. REQUEST AND INQ. RELEASE." Files without lables, or with non-standard labels, are not identified unless the user has provided a routine to do so. The message in this instance consists only of the channel and drive on which the file is to be mounted.

After the proper tapes have been mounted and the Inquiry Request and Inquiry Release keys have been pressed, the program continues by positioning the tapes. Provision is made in the program to read one header label for each file. If there are additional header labels, the user must have provided a routine to read them.

CONTROL CARD FORMAT

Columns 1-7	must contain **CHKPT.
Columns 8-10	must contain the three-digit checkpoint number.
Columns 11-12	must contain **.
Columns 13-14	must contain an R% if checkpoint is taken on channel one. They must contain X if checkpoint is taken on channel two.
Column 15	must contain the drive number of the file on which the checkpoint records were taken.
Column 16	must contain a "U" to indicate the parity in which the checkpoint control record was written (even parity).
Column 17	must contain the symbol which tells if the user's program uses channel two and if it uses overlap. The symbols are: % for channel one nonoverlap; @ for channel one overlap; ⊓ for channel two nonoverlap; and * for channel two overlap. If two channels are used, this column must contain a ⊓ or an *.

IBM

Technical Newsletter

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This Newsletter amends the above publication (Form C28-0278-1) by correcting a typographical omission.

Page	Amendment
8	Under the heading "CONTROL CARD FORMAT," the information for columns 13-14 should read as follows:

> must contain R% if check-
> point is taken on channel one.
> They must contain X ❑ if check-
> point is taken on channel two.