HONEYWELL EDP

SOFTWARE MANUAL

SERIES 200

SYMBOLIC UPDATE A (P)

GENERAL SYSTEM: SERIES 200/BASIC PROGRAMMING SYSTEM

SUBJECT: Programming and Operating Procedures for Symbolic Update A (P), a Program for Updating Easycoder Symbolic Programs Stored on Paper Tape.

SPECIAL INSTRUCTIONS: The information herein reflects the software released as revision 0.

DATE: December 17, 1965

FILE NO. 123.3205.190A.0-112*

31265
8636
Printed in U.S.A.

*When ordering this publication, please specify Title and Underscored portion of File Number.

FOREWORD

This manual describes the programming and operating procedures for Symbolic Update A (P), a program which operates in the Series 200/Basic Programming System. The Symbolic Update program provides a convenient means for correcting or updating Easycoder A symbolic programs which are stored on paper tape.

The Easycoder A symbolic language is presented in the Honeywell Series 200 Programmers' Reference Manual (File No. 113.0006.0000.00.00 for the Model 120 or File No. 113.0005.00.00 for the Models 200/1200/2200). The operating procedures for the control panel and peripheral devices are presented in the Honeywell Series 200 Equipment Operators' Manual (Order No. 040) and in the Models 209/210 Paper Tape Equipment bulletin (DSI-322). The reader should be familiar with the pertinent information presented in the above publications and is assumed to be familiar with the information presented in the Easycoder Paper Tape Assembly and Loader Programs bulletin (DSI-395).

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SECTION I
INTRODUCTION

The Symbolic Update A (P) program provides a convenient means for correcting or updating an Easycoder symbolic program which is stored on paper tape. One common use for this program occurs when there have been perforating errors in the symbolic paper tape. In this case, the Symbolic Update program may be used to accomplish the correction without requiring either the repunching of the entire symbolic program or the repunching of portions of the program and then splicing them into the original symbolic program paper tape. Also, as its name implies, the Symbolic Update program may be used to update an existing paper tape symbolic program or provide a modified version thereof. The output of the Symbolic Update program is punched on paper tape in six-level code which has the proper format to be accepted as input to the Easycoder Paper Tape Assembly Program.

Symbolic Update A (P) is a two phase program consisting of a storage phase and an updating phase. During the storage phase, the changes or corrections are read from paper tape and stored in memory. Subsequently, in the updating phase, the symbolic paper tape to be updated is read and compared with the stored changes, and then the updated symbolic tape is punched reflecting the appropriate changes to the original input tape.

All changes to the original input tape are made on the basis of comparison between the line numbers of the change tape input and the original symbolic tape input. Thus, for the updating process to function properly, the lines must be in the proper line number sequence on both the original input tape and the change tape. There are four ways in which changes may be made to the original symbolic input tape using Symbolic Update A (P):

1. Inserting a new line,
2. Replacing an existing line with a new or changed line,
3. Deleting a single line, and
4. Deleting a block of lines.

EQUIPMENT REQUIREMENTS

The minimum equipment configuration required to operate the Symbolic Update A (P) program is as follows:

1. 4,096 character locations of core memory,
2. One Type 209 Paper Tape Reader, and
3. One Type 210 Paper Tape Punch.

In a 4K machine, approximately 2,500 memory locations are available for storing changes. It should be noted that in larger machines, the additional memory is used to increase the capacity for storing changes. Thus, the storage area is increased by 4,096 characters in an 8K machine and by 8,192 characters in a 12K (or larger) machine.

Optionally, a magnetic tape unit may be used for the loading of Symbolic Update A (P) from an SLT.

SECTION II
INPUT TAPES

This section describes (1) the format and character set of input tapes for the Symbolic Update program (including the applicable control characters), (2) the method of designating a change tape, and (3) the four methods provided to perform the desired changes to the original symbolic paper tape program. The symbolic language accepted as input by the Symbolic Update program is the Easycoder A language described in the Series 200 Programmers' Reference Manual, and the symbolic lines are punched on paper tape as described in the Easycoder Paper Tape Assembly and Loader Programs bulletin.

FORMAT OF PAPER TAPE INPUT

Both the original and change tapes may be punched on 6-, 7-, or 8-level paper tape; however, only the lower six levels are interpreted as data bits by the Symbolic Update program. Change statements, as well as the original symbolic input, are punched on paper tape in continuous format in the order that the statements appear on the coding form. Each symbolic statement on the coding form is represented by one perforated "line of coding" (line) on paper tape, and the last frame of each line must contain a "line termination" control character. All character positions up to the line termination character must be represented by a frame on paper tape. Blank characters must be punched except where the "field control" character is used to position to the first location of the OPERATION CODE field or the OPERANDS field.

In addition to the statements which are transcribed from the coding form to the input tape, there are also five control characters (of which "line termination" and "field control" are two) that may be punched in the symbolic input paper tape. These control characters are part of the standard character set accepted by the Symbolic Update A (P) program. The standard character set is a "graphic subset" of the ASA seven-bit code reduced to six bits (see Table 2-1). The translation function of the Symbolic Update program may be modified to accept any six-bit character set by setting up the correspondence between the paper tape character set and the internal Series 200 code and modifying the translation table accordingly.

The five control characters are described in the following paragraphs and are summarized in Table 2-2. Table 2-2 contains the five control characters by function, graphic representation, octal value as punched on paper tape, and the octal value of the equivalent character in Series 200 internal code (machine language).

Table 2-1. Correspondence of Paper Tape Input Code to Series 200 Internal Code

Alphanumeric Character or Symbol	Paper Tape Input Code (Octal)	Equivalent Series 200 Internal Code (Octal)	Alphanumeric Character or Symbol	Paper Tape Input Code (Octal)	Equivalent Series 200 Internal Code (Octal)
@	00	72	b	40	15
A	01	21	!*	41	15
B	02	22	"	42	55
C	03	23	#	43	52
D	04	24	$	44	53
E	05	25	%	45	35
F	06	26	&	46	17
G	07	27	'	47	12
H	10	30	(	50	74
I	11	31	)	51	34
J	12	41	*	52	54
K	13	42	+	53	20
L	14	43	,	54	73
M	15	44	-	55	40
N	16	45	.	56	33
O	17	46	/	57	61
P	20	47	0	60	00
Q	21	50	1	61	01
R	22	51	2	62	02
S	23	62	3	63	03
T	24	63	4	64	04
U	25	64	5	65	05
V	26	65	6	66	06
W	27	66	7	67	07
X	30	67	8	70	10
Y	31	70	9	71	11
Z	32	71	:	72	14
[	33	77	;	73	32
**	34	36	< *	74	15
]**	35	75	=	75	13
↑**	36	76	>*	76	15
←**	37	37	?**	77	Not translated

NOTES

*Since these characters are not used, the program automatically translates them into spaces (octal 15) if they appear in the input.

**Control characters; see Table 2-2.

Table 2-2. Control Characters

Function	Symbol	Paper Tape Input Code (Octal)	Equivalent Series 200 Internal Code (Octal)
Ignore	?	77	Not translated
Field control	]	35	75
Delete Line	\	34	36
Line termination	←	37	37
End of reel or strip	↑	36	76

Ignore

A frame read from paper tape with an octal value of 77 before translation will be discarded. The updated paper tape will not contain the ignore character.

Field Control

Normally, a frame read from paper tape with an octal value of 75 (after translation) is interpreted as a field control character. The updated paper tape will have field control characters punched exactly as presented to the Symbolic Update program from either the original or change tapes, with one exception. The exception occurs when the field control character is used for field positioning in conjunction with the "delete" function of the Symbolic Update program as outlined on page 2-4.

Delete Line

A frame read from paper tape which results in an octal 36 after translation causes the deletion of the entire line preceding the delete line character. The delete line character is punched to nullify a punch error where that portion of the line punched so far is to be discarded from consideration in any program. The updated tape will not contain any line which has been terminated by a delete line character. The delete line character is in no way related to the "delete" function of the Symbolic Update program that is described on page 2-4.

Line Termination

A frame read from paper tape which results in an octal 37 after translation terminates a line of coding. Line termination characters are punched on the updated tape exactly as presented to the Symbolic Update program.

End of Reel (or Strip)

A frame read from paper tape which results in an octal 76 after translation signals the end of a reel of tape or strip. The last character of a change tape must be an end-of-reel character. Also, when the original symbolic input occupies more than one tape, the last character of each tape except the last tape must be an end-of-reel character.

INPUT TAPE PREPARATION

The following paragraphs primarily detail the preparation of a change tape. However, three general considerations are worthy of noting at this point. First, the change tape must be on one reel of tape and the last character of the change tape must be an end-of-reel character. Second, the original symbolic tape may occupy more than one reel; however, no line may be split between two reels or strips. Third, both types of input tapes must be punched with either a delete line character or a series of ignore characters at the beginning of the tape to accomplish proper positioning of the input tape in the paper tape reader.

Change Tape Designation

The change tape should first be punched with either a delete line character or a series of ignore characters at the beginning of the tape. Immediately following the delete line character or the ignore characters must be the word CHANGE followed by a termination character. This identifies the change tape and insures that it is the tape which is used during the storage phase. Absence of the word CHANGE will result in an error halt.

Change Methods

All changes to the original input tape are made on the basis of comparison between the line numbers of the change tape input and the original symbolic tape input. Therefore, the lines must be in the proper line number sequence on both the original input tape and the change tape. All updating by line number is made after translation into internal code. The four ways in which changes may be made to the original symbolic input tape using Symbolic Update A (P) are outlined in the following paragraphs. It should be noted that the functions of inserting new lines and replacing existing lines do not require the punching of function codes; however, the delete functions must be designated by punching DELETE and the appropriate line numbers as outlined below.

INSERTING A NEW LINE

To insert a new line into the original symbolic program, assign the new line a line number midway between the line numbers of the two lines between which it is to be inserted. A new line is inserted by the Symbolic Update program when the change line number is not found in the input from the original symbolic tape.

REPLACING AN EXISTING LINE WITH A CHANGE LINE

To replace an original line with a change line, assign the change line the same line number as the original line to be replaced. An original line is replaced by a change line when their line numbers are found to be equal.

DELETING A SINGLE LINE

To delete a single line, the word "DELETE" must be punched in the change line using either of two methods. The first method is as follows: (1) assign the delete line the same line number as the original line to be deleted, (2) punch the word DELETE in frame positions 15 through 20, and (3) punch a line termination character immediately following the word DELETE. Note that when using this method, the frame positions between the line number and DELETE must be accounted for by punching blanks (octal 15).

The second method uses the field control character as follows: (1) assign the delete line the same line number as the original line to be deleted, (2) punch the field control character in

frame position 6, (3) punch the word DELETE immediately following the field control character, and (4) punch the line termination character immediately following DELETE.

DELETING A BLOCK OF LINES

The procedures for deleting a block of lines are similar to the methods given above for deleting a single line. To delete a block of lines using the first method, perform the following steps: (1) assign the delete line the same line number as the lowest line number in the block to be deleted, (2) punch the word DELETE in frame positions 15 through 20, (3) punch the high-limit line number immediately following the word DELETE (in frame positions 21 through 25), and (4) punch the line termination character immediately following the high-limit line number (in frame position 26). All original lines which are equal to or greater than the change line number and less than or equal to the line number punched in frame positions 21 through 25 of the change line are not punched on the updated output tape.

To delete a block of lines using the second method, proceed as follows: (1) perform the first three steps of the second method for deleting a single line, (2) punch the high-limit line number immediately following DELETE, and (3) punch the line termination character immediately following the high-limit number.

SECTION III
PROGRAMMING CONSIDERATIONS

This section outlines programming considerations for the Symbolic Update program using the example in Figure 3-1 to illustrate their application. As may be observed, Figure 3-1 is coded in three parts which represent (1) the original symbolic input program called EXMPLE, (2) changes to be made to the original symbolic program, and (3) a representation of the updated symbolic output program. Normally, only the changes are coded at the time of updating; however, information pertaining to the preparation of an original symbolic input program may be obtained by referring to the Easycoder Paper Tape Assembly and Loader Programs bulletin. Further, the updated symbolic program is punched on paper tape and does not appear on the coding form; it is shown in Figure 3-1 for purposes of illustration only.

The program called EXMPLE (see Figure 3-1) has three errors to correct: constant K1 must be corrected, constant K2 was omitted and must be inserted, and counter CTRC and constant K3 are no longer needed and must be deleted. The second coding form in the illustration shows the coding to accomplish the necessary corrections. First, a delete line character or a series of ignore characters are established at the beginning immediately followed by the word CHANGE. The "change" line (and each succeeding line) is terminated by a line termination character. Since CTRC is no longer needed, line 00040 is deleted. Line 00050 is coded in the correct form to replace the incorrect constant coded for K1 in the original symbolic program. Line 00055 inserts constant K2 which had previously been omitted. Lines 00060, 00090, and 00100 are deleted to eliminate constant K3 and counter CTRC which are no longer needed. Lines 00040 and 00060 are deleted using the single deletion method and lines 00090 and 00100 are deleted using the block deletion method.

Note the use of control characters as designated by the encircled numbers on Figure 3-1:

(1) Each tape has either a delete line character or a series of ignore characters at the beginning of tape.

(2) Each line is terminated by a line termination character.

(3) When perforating a tape, blanks (octal 15) must be punched to account for blank space on the coding form, however, the field control character may be used as described for the "delete" function outlined on page 2-4.

(4) The last frame of the change tape is an end-of-reel character.

EASYCODER
CODING FORM

PROBLEM ORIGINAL SYMBOLIC INPUT PROGRAM PROGRAMMER _____ DATE ___ . ___ PAGE ___ OF ___

CARD NUMBER	TYPE	MARK	LOCATION	OPERATION CODE	OPERANDS
1 2 3 4 5	6	7	8 ... 14	15 ... 20	21 ... 62
(1)					
00010				PROG	EXMPLE(2)
00020			CTRA	DCW	#300(2)
00030			CTRB	DCW	#300(2)
00040			CTRC	DCW	#300(2)
00050			K1	DCW	#1C002(2)
00060			K3	DCW	#1C003(2)
00070			START	BA	K1,CTRA(2)
00080				BA	K2,CTRB(2)
00090				BA	K3,CTRC(2)
00100				BA	CTRB,CTRC(2)
00110				MCW	CTRA,2+X1(2)
00500				END	START(2)

EASYCODER
CODING FORM

PROBLEM CHANGES PROGRAMMER _____ DATE ___ . ___ PAGE ___ OF ___

CARD NUMBER	TYPE	MARK	LOCATION	OPERATION CODE	OPERANDS	
1 2 3 4 5	6	7	8 ... 14	15 ... 20	21 ... 62	63 ... 80
(1)CHANGE(2)						(CHANGE TAPE)
00040	(3)			DELETE	(2)	(DELETE LINE 00044)
00050			K1	DCW	#1C001(2)	(REPLACE LINE 00050)
00055			K2	DCW	#1C002(2)	(INSERT LINE 00055)
00060	(3)			DELETE	(2)	(DELETE LINE 00060)
00090	(3)			DELETE	00100(2)(4)	(BLOCK DELETE LINES 00090 THROUGH 00100)

EASYCODER
CODING FORM

PROBLEM REPRESENTATION OF UPDATED SYMBOLIC PROGRAM PROGRAMMER _____ DATE ___ . ___ PAGE ___ OF ___

CARD NUMBER	TYPE	MARK	LOCATION	OPERATION CODE	OPERANDS
1 2 3 4 5	6	7	8 ... 14	15 ... 20	21 ... 62
(1)					
00010				PROG	EXMPLE(2)
00020			CTRA	DCW	#300(2)
00030			CTRB	DCW	#300(2)
00050			K1	DCW	#1C001(2)
00055			K2	DCW	#1C002(2)
00070			START	BA	K1,CTRA(2)
00080				BA	K2,CTRB(2)
00110				MCW	CTRA,2+X1(2)
00500				END	START(2)

Figure 3-1. Updating an Original Symbolic Program

SECTION IV
OPERATIONAL CONSIDERATIONS

LOADING

When both a paper tape reader and a magnetic tape unit are available, the user has the option of loading the Symbolic Update A (P) program from either paper tape or magnetic tape (SLT). It should be noted that once program loading has been initiated, regardless of which loading media is used, the various control memory registers should not be altered, and the INITIALIZE button must not be used in any of the transitions between the loading, storing, or updating phases.

Loading from Paper Tape

When the Symbolic Update program is loaded from paper tape, two bootstrap operations are required; the first positions the tape at the beginning of the bootstrap record and the second reads the bootstrap record. Before depressing the RUN button, SENSE switch 1 must be ON to halt after loading. This halt is necessary to allow the operator to remove the program tape and mount the change tape.

Loading from an SLT

When the Symbolic Update program is loaded from an SLT, the halt after loading for removing the program tape and mounting the change tape may be eliminated. This is accomplished by mounting the change tape on the paper tape reader and setting SENSE switch 1 OFF before loading the Symbolic Update program from the SLT. Loading Symbolic Update in this manner causes the storage phase processing to be started automatically.

STORAGE

After the Symbolic Update program has been loaded into memory, the changes to be made to the original symbolic paper tape must be read from the change tape and stored in memory. When the change tape is mounted, the tape must be positioned to satisfy one of the following conditions: (1) if the change line is preceded by a series of ignore characters, the tape must be mounted so that one of the ignore characters is the first character to be read; or (2) if the change line is preceded by a delete line character, the tape may be positioned anywhere before the delete line character. Thereafter, depressing the RUN button initiates the storage phase processing.

The change storage capacity is limited to the amount of available memory after the program and buffer areas have been assigned. If the change lines exceed the available storage, an overflow

is signaled (the machine halts with 04011 in the B-address register), and the line number of the next change is saved by the Symbolic Update program to be used as a search parameter during the next pass of the storage phase. When the overflow occurs, a series of storage and updating passes must be executed to produce the completely updated symbolic paper tape.

After all changes have been stored, the machine halts with 04077 in the B-address register. When either the 04011 or 04077 halt is encountered, the change tape must be removed and the original symbolic tape must be mounted on the paper tape reader in preparation for the updating phase.

UPDATING

After the storage phase has been completed or the change storage capacity has been reached, the original symbolic paper tape must be mounted to satisfy one of the two conditions specified above for the change tape. Also, an unpunched reel of paper tape large enough to accommodate the updated symbolic program should be mounted on the paper tape punch. At this point, depressing the RUN button initiates the updating phase processing.

If the machine halts with 04012 in the B-address register, the symbolic tape has been updated to the line at which the storage limit was encountered during the previous storage phase. In this case, the original symbolic tape must be removed and the change tape remounted and repositioned at the normal beginning of tape. Merely depressing the RUN button automatically initiates processing again in the storage phase beginning with the storage of the change line which caused the overflow during the preceding storage phase. The storage phase processing then proceeds as described above in the paragraph entitled "Storage."

When the machine halts with 04777 in the B-address register, the normal end-of-job halt has been reached. At this point, another program can be updated without reloading the Symbolic Update program or disturbing the contents of memory. This is accomplished by merely mounting the change tape of the next program to be updated and depressing the RUN button.

End-of-Reel Conditions

There are two end-of-reel conditions which may occur during the updating phase. One occurs when the end-of-reel character on a symbolic input tape is encountered, and the other occurs when the updated program exceeds the length of the output tape.

If the original symbolic input program is not on one reel of tape, the machine will halt with 0cu30 (cu: control unit number) in the B-address register when the end-of-reel character is encountered. It should be noted that a symbolic input tape must be terminated with an

end-of-reel character to signal to the Symbolic Update program that the symbolic input program is continued on another reel of paper tape. When the end-of-reel halt is encountered, the operator removes the present reel and mounts the next reel of the symbolic input program on the paper tape reader and then depresses the RUN button to continue the updating phase.

When it is likely that the updated program will exceed the length of the paper tape mounted on the paper tape punch, the operator must observe the TAPE LOW indicator and the amount of unpunched tape remaining as the updated program is being punched. When the TAPE LOW indication occurs, the operator must set SENSE switch 4 ON. Setting SENSE switch 4 ON results in the punching of an end-of-reel character and the halting of the machine with 0cu31 (cu: control unit number) in the B-address register. At this point, the output tape must be removed and a new tape mounted on the paper tape punch. The updating process may then be continued by depressing the RUN button.

SECTION V
OPERATING PROCEDURES

The Symbolic Update A (P) program has three operational parts which normally require operator attention or intervention. The first is loading the Symbolic Update program, the second is reading and storing the contents of the change tape, and the third is reading the original symbolic input tape and performing the updating processing which results in the punching of an updated symbolic output tape. Each of the three requires manual intervention when the Symbolic Update program is loaded from paper tape. However, when the Symbolic Update program is loaded from an SLT, SENSE switch 1 may be set OFF and the change tape mounted on the paper tape reader; then, when the RUN button is depressed, processing proceeds automatically from loading into the storage phase without halting.

Once the Symbolic Update program has been loaded into memory, normal operator action is limited to mounting and demounting the appropriate tapes and depressing the RUN button on the operator's control panel (or console). It should be noted that the INITIALIZE button and the various registers should not be used or disturbed during any of the transitions between phases. Further, the storage and updating phases may be repeated as many times as necessary to update all the changes onto the symbolic output tape. To accomplish this transition between phases, all that is required is to properly mount the appropriate tape and depress the RUN button.

For additional operational considerations, refer to Section IV.

POSITIONING INPUT PAPER TAPES

Both change and symbolic input tapes are positioned in the paper tape reader in the same manner using one of two methods. Which method is applicable depends upon how the tape leader is punched. If the leader is punched with a series of ignore characters, the tape must be positioned so that one of the ignore characters is the first frame to be read. If the leader contains a delete line character immediately preceding the first data frame, the tape may be positioned to begin reading anywhere before the delete line character.

ADDRESS ASSIGNMENTS FOR THE PAPER TAPE READER AND PUNCH

The Symbolic Update program normally assumes that the paper tape equipment is assigned to the recommended control unit number octal 06. However, the reader and the punch may be assigned other address assignments jointly or independently by either of two methods. The first method involves changing the operand of the appropriate symbolic line and then assembling the

Symbolic Update program; the second method involves entering the control unit number into the appropriate memory location at the halt after loading.

For the paper tape reader, the first method is accomplished by changing the operand of symbolic line number 00235 (constant label: RCU) to the proper control unit number and then assembling the Symbolic Update program. The second method is accomplished by setting SENSE switch 1 ON to halt after loading; at this halt, the proper control unit number is entered into location 00213.

Similarly, for the paper tape punch, the first method is accomplished by changing the operand of symbolic line number 00240 (constant label: PCU) to the proper control unit number and assembling the Symbolic Update program. The second method is accomplished by setting SENSE switch 1 ON to halt after loading; at this halt, the proper control unit number is entered into location 00214.

LOADING THE SYMBOLIC UPDATE PROGRAM FROM PAPER TAPE

To load the Symbolic Update program from paper tape, perform the following steps:

1. Cycle up the paper tape reader and mount the program tape with the unpunched tape leader under the read head.
2. Depress STOP.
3. Depress INITIALIZE.
4. Enter the octal address of the paper tape reader into the CONTENTS register.
5. Depress BOOTSTRAP.
6. Depress STOP.
7. Enter the octal address of the paper tape reader into the CONTENTS register.
8. Enter 00000 into the ADDRESS register.
9. Depress BOOTSTRAP.
10. Set SENSE switch 1 ON.
11. Depress RUN.
12. When the machine halts after loading, remove the program tape and mount the change tape.
13. Depress RUN.
14. When the machine halts, display the B-address register and determine the type of halt using Table 5-1; then perform the indicated action.

LOADING THE SYMBOLIC UPDATE PROGRAM FROM AN SLT

The Symbolic Update program (PASUPΔ) may be loaded from magnetic tape using the normal procedures for program loading from an SLT (bootstraping into location 00000). If the change tape is mounted and properly positioned before the RUN button is depressed, SENSE

switch 1 may be OFF thereby enabling change storage processing to begin automatically after loading. Otherwise, set SENSE switch 1 ON to halt after loading and allow the operator to mount the change tape. When the machine halts, display the B-address register and determine the type of halt using Table 5-1; then perform the indicated action.

Table 5-1. Coded Halts

Cause	A Address	B Address	Operator Action
Storage Phase			
A line with "CHANGE" in positions 1-6 has not been detected within three lines after starting.	00000	04001	Check that the proper tape is mounted and replace if necessary. Otherwise, depress the RUN button to continue searching for "CHANGE."
Changes not in Line Number sequence.	00000	04006	Determine whether to continue run or to correct change tape and start over. To continue run and store changes out of sequence, depress RUN.
Storage area has been filled with change lines.	00000	04011	Remove change tape and mount the original symbolic tape. To proceed with updating phase processing, depress RUN.
Change tape has been completely stored.	00000	04077	Remove change tape and mount the original symbolic tape. To proceed with updating phase processing, depress RUN.
Updating Phase			
A "PROG" line has not been detected within three lines after starting.	00000	04002	Check that the proper tape is mounted and replace if necessary. Otherwise, depress the RUN button to continue searching for "PROG."
Single line to be deleted has not been found.	nnnnn*	04003	Determine whether to continue the run and ignore the deletion (record the line number) or make the necessary corrections to the input and start over. The starting location of the change line number is provided in the A-address register. To continue the run, depress RUN.
First line of a block deletion has not been found.	nnnnn*	04004	Determine whether to continue the run and ignore the deletion (by depressing RUN) or make the necessary corrections to the input and start over.
Last line of a block deletion has not been found.	nnnnn*	04005	Determine whether to continue the run with all lines up to the high line number deleted (by depressing RUN) or make the necessary corrections to the input and start over.
Updating is completed to change storage limit.	00000	04012	Remove the original symbolic tape. Remount and reposition the change tape at the beginning of tape. To proceed automatically from the point where the previous storage phase pass left off, depress RUN.

Table 5-1 (cont). Coded Halts

Cause	A Address	B Address	Operator Action
Updating Phase (cont)			
Input end of reel has been detected (not end of program).	00000	0cu30**	Remove the original symbolic tape. Mount the next reel of symbolic tape. To continue the updating phase processing, depress RUN.
Output end of reel has been detected. (This halt results when the operator sets SENSE switch 4 ON; it is not the end of program.)	00000	0cu31**	Remove output tape from paper tape punch and mount a new reel of unpunched tape. To continue the updating phase processing, depress RUN.
End of updating run.	00000	04777	Remove both input and output tapes. To update another program without reloading the Symbolic Update program, mount the appropriate change tape. To begin the storage phase processing for the new program, depress RUN.

*nnnnn: starting location of the change line number.
**cu: control unit number.

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USERS' REMARKS FORM

TITLE: SYMBOLIC UPDATE A (P)
SOFTWARE MANUAL

DATED: DECEMBER 17, 1965

FILE NO: 123.3205.190A.0-112*

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