UNIVERSITY OF ILLINOIS

DIGITAL COMPUTER

LIBRARY ROUTINE X 9 - 169

TITLE	Program Interruption Routine (Without Sum Check) (SADOI or DOI)
NUMBER OF WORDS	34
TIME	Depends on the number of words to be reset
ACCURACY	No accuracy is gained or lost by using this subroutine
TEMPORARY STORAGE	None external to subroutine
PRESET PARAMETERS	None
ENTRY	Standard. The programmer may arrange his main program so that at some predetermined point the subroutine will be entered, automatically. On the other hand, it may be desirable to give the operator the option of removing the program from the machine via the subroutine. In this case the following set of orders placed in a main loop of the regular program will accomplish the purpose.

p-1	
p	20 p+1F 50 pF
p+1	26 nF

where "n" is the location of the first word of the subroutine. The program will be run on "stop disable" until it is required to stop it. There the black switch will be put in the obey position, and the machine will be restarted with the white switch where it stops on a 20 order from "p".

PURPOSE	This subroutine may be included in any program which is to be erased from the memory after the main program has run for some length of time, and before it is completed. When the tape is read into the memory a second time and control is transferred to the subroutine, it replaces the content of some specified set of memory locations with their contents before erasure occurred. In this way the memory (or all relevant parts) may be restored to the state before erasure without much loss of time. The accumulator is also automatically reset.

METHOD OF USE

When it is desired to stop the program, control is transferred to the subroutine. A data tape must be in the reader at this time, bearing decimal addresses of memory locations to be reset. Each address is followed by S or K. An address followed by K is interpreted by the routine to mean the first of a succession of memory locations to be reset the last of which is specified by the next address on the tape with an S termination. (Note: the K address must be less than or equal to the S address or the program will go into a loop.) An isolated word to be reset is indicated by its address followed by S. After the addresses and their accompanying symbols the symbol N must be punched to indicate the end of the tape.

A typical specification tape could be:

25 S	reset location 25
150 K	reset locations 150
200 S	to 200 inclusive
75 S	reset location 75
N	end of tape

The subroutine now punches out a sexadecimal tape. The first word is a control transfer to the appropriate section of the subroutine (this is actually the 32nd word of the subroutine.) Next the accumulator contents are punched out followed by the words to be reset preceded by their addresses and interspersed with appropriate line feeds and carriage returns. In case of a succession of words only the first address is punched. The word containing the link is punched out last and the program stops on an OF order from the right hand side of the eighteenth word of the subroutine.

When the program is to be put back, the master tape is first read into the memory. The program is stopped soon after by the white switch and the output tape is read in with a bootstrap start. The subroutine reads in this tape, resets the memory and the accumulator, and transfers control back to the main program via the link.

REMARKS

In this version of the subroutine, it is not essential to reset all words in the memory that have changed during calculation. The programmer must decide what parts of the memory must be reset to continue calculation and must specify them.

RT: 10/10/60

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APPROVED BY J. P. Nash

LOCATION	ORDER 00K(X9)	NOTES	Page 1 X9
0	40 27L	Store $N(R_1)$	
	K5 F	Set link	
1	42 32L		
	92 63F		
2	L5 31L	Output control transfer read in by bootstrap	
	82 40F		
3	92 131F		
	L5 27L	Read out accumulator contents	
4	82 40F		
	92 3F		
5	92 131F		
	41 1L		
6	41 0L		
	81 4F		
7	L0 33L	Test for K, S, or N	
	36 13L		
8	L4 33L		
	50 L		
9	74 33L	Form integer	
	S5 F		
10	40 L		
	L3 2L		
11	32 6L		
	L5 L	If the last terminating symbol was K, skip this	
12	40 1L		
	22 6L		
13	40 2L		
	00 38F	Test for N	
14	36 18L		
	F5 29L		
15	00 28F		
	82 12F	If N	
16	92 131F		
	L5 32L		
17	82 40F		
	0F F		

LOCATION	ORDER	NOTES	PAGE 2 X9
18	00 1F		
	36 6L		
19	L5 1L		
	42 21L		
20	00 28F		
	82 12F		
21	92 131F		
	L5 L		
22	82 40F		
	F5 1L		
23	40 1L		
	42 21L		
24	F0 L		
	32 4L		
25	26 21L		
	F5 30L		
26	42 30L		
	26 30L		
27	91 4F		
	40 L		
28	L7 L		
	32 25L		
29	81 12F		
	42 30L		
30	81 40F		
	40 L		
31	26 27L		
	00 F		
32	L5 1L		
	22 F		
33	00 F		
	00 10F