LOOPING INTERPRETIVE ROUTINE

Program H1-33.0

GENERAL PRECISION, INC. / COMMERCIAL COMPUTER

REVISION NOTICE

This publication replaces previous descriptions of "Looping Interpretive Routine," program H1-33.0. The program references have been changed to their proper designations.

FUNCTION

"Looping Interpretive Routine" is used to facilitate programming of loops. This program will increment instructions, perform the required number of loops, and reset the incremented instructions to their original values.

Program H1-33.0 facilitates programming by removing from the programmer the responsibility of writing, incrementing, and resetting routines for each loop. The routine simplifies programming by reducing the number of instructions required and, therefore, programming errors are reduced. Also, the logic of a program is simpler; this eases the burden on the programmer and tends towards faster, more accurate programming.

INPUT

The following data must be supplied to the computer:

1. The instructions to be incremented prefixed with 800.
2. The R, U, I, N calling sequence.

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CALLING SEQUENCE

Location	Instruction	Address
XXXX - n	Routine to be looped	
XXXX	R	Lo
XXXX + 1	U	Lo
XXXX + 2	I	xxxx
XXXX + 3	N	yyyy
XXXX + 4	etc.	

Where:

xxxx - First instruction of the routine which is to be looped (in decimal), e.g., I 2500 - first instruction in 2500.

yyyy - Number of loops (in decimal), e.g., xN 0025 - loop 25 times. This instruction should not be modified.

PROGRAMMED STOPS

None.

TIME

Programming time is reduced by approximately two-thirds. The operating time varies for each loop and is dependent upon the size and number of loops.

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STORAGE

63 locations of instructions and constants are required in memory. No temporary storage is used.

NOTES

1. The 800T instruction (for use with the TRANSFER CONTROL button) must not be used inside the loop unless it is meant to be incremented.

2. If an improper exit is made from the subject program, the following change must be made manually: in location Lo + 2, write U (Lo + 03) in place of U (Lo + 18).

3. It is possible to transfer out of the routine which is being looped (e.g., to another subroutine - sine, cos, print, etc.) as long as there are no instructions to be incremented in the routine. For example: find the $\log_{10}$ of 20 numbers located in 3000 to 3019 at q = 10. Store the log in 3500 to 3519 at q = 6. The log routine is located in track 36 and the looping routine in track 40.

Location	Instruction	
1500	800B 3000	Argument at q=10
1501	R 3624	Log routine
1502	U 3600	
1503	Z 0010	
1504	Z 0002	
1505	800C 3500	
1506	R 4000	Looping routine
1507	U 4000	
1508	I 1500	
1509	N 0020	
1510	etc.	

EXAMPLE

Solve C = 2x + y for 10 values of x located in 2515 to 2524 at q = 10, 10 values of y located in 3021 to 3030 at q = 20. Locate C in 3500 to 3509 at q = 18. These constants are available: 2 at q = 5 in 2400, 1 at q = 5 in 2401, 1 at q = 2 in 2402. Program H1-33.0 is located in track 40.

Location	Instruction	Address	Result
1500	B 2400	2 at q=5	2 at q=5
1501	800M 2515	x at q=10	2x at q=15
1502	M 2401	1 at q=5	2x at q=20
1503	800A 3021	y at q=20	(2x + y) at q=20
1504	D 2402	1 at q=2	(2x + y) at q=18
1505	800C 3500	C at q=18	
1506	R 4000		
1507	U 4000		
1508	I 1500	Looping routine	
1509	N 0010		
1510	etc.		

SAMPLE PROBLEM

$$L = \frac{(2x + y)Z}{W}$$

Calculate for 10 values of x located in 3100 to 3109 at q = 10, 10 values of y located in 3200 to 3209 at q = 20, 10 values of Z located in 3300 at q = 15, and 10 values of W located in 3400 to 3409 at q = 10. Store L in 3500 to 3509 at q = 23. The following constants are available: 2 at q = 15 in 3000, 1 at q = 5 in 3001, and 1 at q = 3 in 3002.

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SAMPLE PROBLEM

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION OPERATION	INSTRUCTION ADDRESS	STOP	CONTENTS OF ADDRESS	NOTES
;0002000	/						
/0000000	/	☒					
		2000	B	3000	/	2 at 15	
		01	800M	3100	/	X at 10	
		02	D	3001	/	1 at 5	
		03	800A	3200	/	☒ Y at 20	
		04	D	3001	/	1 at 5	PROBLEM
		05	800M	3300	/	Z at 15	
		06	800D	3400	/	W at 10	
		07	M	3002	/	☒ 1 at 3	
		08	800C	3500	/	L at 23	
		09	R	4000	/	L_0	
		10	U	4000	/	L_0	LOOPING
		11	I	2000	/	☒ FIRST INST.	SUBROUTINE
		12	N	0010	/	NO. OF LOOPS	
		13	Z	0000	/	STOP	
					/		