



REVISION NOTICE

This publication replaces previous descriptions of "Matrix Vector Multiply 2," program D1-229.1. The program designations have been changed to current usage.

FUNCTION

"Matrix Vector Multiply 2" enables the user to multiply a matrix by a vector and store the resultant product vector.

INPUT

The following data must be supplied to the computer:

1. A matrix consisting of  $i$  rows and  $j$  columns, in floating point form, is stored consecutively (row major, column minor) beginning in location  $A_0$ .
2. A column vector consisting of  $j$  terms in floating point form is stored consecutively beginning in location  $B_0$ .
3. The Floating Point Interpretive System 1, program H1-24.0, is stored beginning in location  $F$ .
4. A calling sequence containing the following information:
  - (a) The location of program H1-24.0 ( $F$ ).
  - (b) The initial location of the matrix ( $A_0$ ).
  - (c) The number of rows ( $i$ ) at  $q = 23$ , and the number of columns ( $j$ ), at  $q = 29$ , in the matrix.
  - (d) The initial location of the vector ( $B_0$ ).
  - (e) The initial location for the product vector ( $C_0$ ).

## MATRIX VECTOR MULTIPLY 2

### CALLING SEQUENCE

<u>Location</u>	<u>Order</u>	<u>Address</u>	<u>Notes</u>
XXXX	R	Lo	Initial location of
XXXX + 1	U	Lo	program D1-229.1
XXXX + 2	Z	F	Initial location of
			program H1-24.0
XXXX + 3	Z	A <sub>0</sub>	Reserve i x j location
XXXX + 4	Z	ij	i in track; j in sector
XXXX + 5	Z	B <sub>0</sub>	Reserve j locations
XXXX + 6	Z	C <sub>0</sub>	Reserve i locations
XXXX + 7	etc.		

### OUTPUT

The elements of product vector C, in floating point form, are stored consecutively beginning in location C<sub>0</sub>.

### LIMITS

$2 \leq i \leq 63$  (i and j need not be equal)  
 $2 \leq j \leq 63$

### TIME

.90ij seconds are required.

### STORAGE

96 locations (1 track, 32 sectors) are required for storage of instructions and constants. No temporary storage is needed except as required by program H1-24.0.



Job No. \_\_\_\_\_ Prog. No. 29.1 Prep. by \_\_\_\_\_ Ck'd. by \_\_\_\_\_ Date \_\_\_\_\_

Problem FLT. POINT MATRIX-VECTOR MULTIPLICATION

Program Input Codes	Stop	Location	Instruction Op.	Address	Stop	Contents of Address	Notes
		3 2	Y	0114		B <sub>0</sub> + j	
		3 3	S	0060		j	
		3 4	U	0057			
		3 5	XZ	0001	<input checked="" type="checkbox"/>	1@29	
		3 6	XZ	0001		1@29	
		3 7	H	[ ]		C <sub>0</sub> + i	
		3 8	B	0060		j ctr	
		3 9	A	0054	<input checked="" type="checkbox"/>	Loc of a <sub>i-1</sub>	
		4 0	Y	0054			
		4 1	A	0113		1@29	
		4 2	Y	0121			
		4 3	U	0105	<input checked="" type="checkbox"/>		
		4 4	20000000	0000		1@6	
		4 5					
		4 6		4		1@29	
		4 7	[ ]		<input checked="" type="checkbox"/>	Jump for i j	
		4 8		WJ		Mask	
		4 9	A	0114		B <sub>0</sub> + j	
		5 0	Y	0122			
		5 1	U	0116	<input checked="" type="checkbox"/>		
		5 2	R	[ ]		} 24.0	
		5 3	U	[ ]		}	
		5 4	P	[ ]		a <sub>i,1</sub>	
		5 5	M	[ ]	<input checked="" type="checkbox"/>	a <sub>i,1</sub>	
		5 6	U	0121			
		5 7	Y	0055		B <sub>0</sub>	
		5 8	B	[α+3]		A <sub>0</sub>	
		5 9	U	0040	<input checked="" type="checkbox"/>		
		6 0	Z	0000		j ctr @ 29	
		6 1					
		6 2	B	0113		1@29	
		6 3	A	0129	<input checked="" type="checkbox"/>		

Conditional Stop Code



Carriage Return

Job No. \_\_\_\_\_ Prog. No. 29.1 Prep. by \_\_\_\_\_ Ck'd. by \_\_\_\_\_ Date \_\_\_\_\_

Problem FLT. POINT MATRIX-VECTOR MULTIPLICATION

Program Input Codes	Stop	Location	Instruction Op. Address	Stop	Contents of Address	Notes
	<input checked="" type="checkbox"/>					
		0 0	Y0129			
		0 1	S0037		Cot j	
		0 2	T0038			
		0 3	V[α+7]	<input checked="" type="checkbox"/>	EXIT	
		0 4	N[ ]		N[B0+j-1]	
		0 5	B0055			
		0 6	A0035		1 @ 29	
		0 7	Y0122	<input checked="" type="checkbox"/>		
		0 8	V0052			
		0 9				
		1 0				
		1 1		<input checked="" type="checkbox"/>		
		1 2				
		1 3	XZ0001		1 @ 29	
		1 4	N[ ]		B0+j	
		1 5		<input checked="" type="checkbox"/>		
		1 6	B0121			
		1 7	A0046		1 @ 29	
		1 8	Y0121			
		1 9	R[ ]	<input checked="" type="checkbox"/>	} 24.0	
		2 0	V[ ]		}	
		2 1	P[ ]		a <sub>i,j</sub>	
		2 2	N[ ]		b <sub>i,1</sub>	
		2 3	XE0000	<input checked="" type="checkbox"/>		
		2 4	B0122			
		2 5	S0104		N[B0+j-1]	
		2 6	T0049			
		2 7	R[ ]	<input checked="" type="checkbox"/>	} 24.0	
		2 8	V[ ]		}	
		2 9	H[ ]		C <sub>i,1</sub>	
		3 0	XE0000			
		3 1	V0062	<input checked="" type="checkbox"/>		

Conditional Stop Code



Carriage Return