REVISION NOTICE

This publication replaces previous descriptions of "Matrix Vector Multiply 3," program D1-230.1. Program designations have been changed to their current nomenclature.

FUNCTION

"Matrix Vector Multiply 3" enables the user to multiply a matrix times a vector and store the resultant product vector.

INPUT

"INPUT" consists of the following:

1. A matrix consisting of i rows and j columns in extended range floating point format 2 stored consecutively (row major, column minor) beginning in location A_o.

2. A column vector consisting of j terms in extended range floating point format 2 stored consecutively beginning in location B_o.

3. The Floating Point Interpretive System 2, program H1-24.1 beginning in location F.

4. A calling sequence containing the following information:

   a. The location of program H1-24.1 (F).
   b. The initial location of the matrix (A_o).
   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_o).
   e. The initial location for the product-vector (C_o).

MATRIX VECTOR MULTIPLY 3

CALLING SEQUENCE

Location	Order	Address	Notes
XXXX	R	Lo	Initial location of program D1-230.1.
XXXX + 1	U	Lo	
XXXX + 2	Z	F	Initial location of program H1-24.1.
XXXX + 3	Z	A_o	Reserve 2 (i x j) locations.
XXXX + 4	Z	ij	i in track; j in sector.
XXXX + 5	Z	B_o	Reserve 2 j locations.
XXXX + 6	Z	C_o	Reserve 2 i locations.
XXXX + 7	etc.		

OUTPUT

The elements of product - vector C in extended range floating point format 2 are stored consecutively beginning in location C_o.

LIMITS

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

$2 \leq j \leq 63$

TIME

i j seconds are required to complete the multiplication.

STORAGE

96 locations (1 1/2 tracks) of memory are required for storage of instructions and constants. No temporary storage is used except as required by program H1-24.1.

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Job No. _____ Prog. No. 30.1 Prep. by _____ Ck'd. by _____ Date _____

Problem E.R.F.P. MATRIX-VECTOR MULTIPLICATION

Program Input Codes	Stop	Location	Instruction Op.	Address	Stop	Contents of Address	Notes
	,						
	, ☒						
		00	B	[α+2]	.		
		01	Y	0127	.		
		02	Y	0052	.	commit to	
		03	Y	0053	. ☒	24	
		04	Y	0119	.		
		05	Y	0120	.		
		06	Y	0128	.		
		07	B	0036	. ☒	1@29	
		08	A	0000	.		
		09	Y	0057	.	α+3	
		10	A	0036	.	1@29	
		11	Y	0020	. ☒	α+4	Decode calling sequence
		12	A	0036	.	1@29	
		13	Y	0031	.	α+5	
		14	A	0036	.	1@29	
		15	Y	0018	. ☒	α+6	
		16	A	0036	.	1@29	
		17	Y	0103	.	α+7	
		18	B	[α+6]	.	Lo of $\vec{c}$	
		19	Y	0129	. ☒	Co	
		20	B	[α+4]	.	i j	
		21	H	0048	.	i@23 j@29	
		22	M	0044	.	1@5	
		23	E	0045	. ☒	XZ0162	
		24	A	0129	.	Co	
		25	Y	0037	.	Co+2i	
		26	B	0048	.	i j	
		27	A	0048	. ☒	i j	
		28	E	0045	.	XZ0162	
		29	H	0060	.	2j ctr @29	
		30	S	0059	.	2@29	
		31	A	[α+5]	. ☒	Lo of $\vec{b}$	

' Conditional Stop Code ☒ Carriage Return

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Job No. _____ Prog. No. 30.1 Prep. by _____ Ck'd. by _____ Date _____ Page 2 of 3

Problem E.R.F.P. MATRIX-VECTOR MULTIPLICATION Track _____

Program Input Codes	Stop	Location	Instruction Op.	Address	Stop	Contents of Address	Notes
	'						
	.	☒					
		32	Y	0104	.	b0 + 2(j-1)	
		33	A	0059	.	2@29	
		34	U	0109	.		
		35	XZ	0002	.	☒ 2@29	
		36	XZ	0001	.	1@29	
		37	8.0.0H	[ ]	.	C0 + 2i	
		38	B	0060	.	2j@29	
		39	A	0054	.	☒ Loc. of a i-1,1	
		40	Y	0054	.	a i,1	
		41	A	0113	.	2@29	
		42	Y	0121	.		
		43	U	0105	.	☒	
,0.0.0.0.0.05	'	44	40	0.0.0.0	.	1@5	
		45		W.8	.	XZ 0162	
		46		8	.	2@29	
		47			.	☒	
		48	[	]	.	Temp for i j	
		49	A	0114	.	B0 + 2j	
		50	Y	0122	.		
		51	U	0116	.	☒	
		52	R	[ ]	.	} 24.1	
		53	U	[ ]	.	}	
		54	8.0.0P	[ ]	.	a i,1	
		55	8.0.0M	[ ]	.	☒ b i,1	
		56	U	0121	.		
		57	B	[α+3]	.	A0	
		58	U	0040	.		
		59	XZ	0002	.	☒ 2@29	
		60	Z	0000	.	2j@29	
		61			.		
		62	B	0113	.	2@29	
		63	A	0129	.	☒	

' Conditional Stop Code ☒ Carriage Return

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Job No. _____ Prog. No. 30.1 Prep. by _____ Ck'd. by _____ Date _____ Page 3 of 3

Problem E.R.E.P. MATRIX-VECTOR MULTIPLICATION

Program Input Codes	Stop	Location	Instruction Op.	Address	Stop	Contents of Address	Notes
	,						
	, ☒						
		00	Y	0129	.		
		01	S	0037	.		
		02	T	0038	.		
		03	U	[α+7]	. ☒	exit	
		04	800N	[ ]	.	N[Bo+2(j-1)]	
		05	B	0055	.		
		06	A	0035	.	2 @29	
		07	Y	0122	. ☒		
		08	U	0052	.		
		09	Y	0114	.	bo+2j	
		10	S	0060	.	2j	
		11	Y	0055	. ☒	bo	
		12	U	0057	.		
		13	X.Z	0002	.	2 @29	
		14	N	[ ]	.	Bo+2j	
		15			. ☒		
		16	B	0121	.		
		17	A	0046	.	2 @29	
		18	Y	0121	.		
		19	R	[ ]	. ☒	} 24.1	
		20	U	[ ]	.	}	
		21	800P	[ ]	.	a i, j	
		22	800N	[ ]	.	b i, 1	
		23	X.E	0000	. ☒		
		24	B	0122	.		
		25	S	0104	.	N[Bo+2(j-1)]	
		26	T	0049	.		
		27	R	[ ]	. ☒	} 24.1	
		28	U	[ ]	.	}	
		29	800H	[ ]	.	C i, 1	
		30	X.E	0000	.		
		31	U	0062	. ☒		

' Conditional Stop Code ☒ Carriage Return

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