



REVISION NOTICE

This description replaces previous descriptions of "Matrix Transpose 4," program D1-439.4. Program references have been changed to current designations.

FUNCTION

"Matrix Transpose 4" enables the interpretive routine to transpose a square matrix. The transposed matrix will either replace the given matrix in memory or will be placed in another storage area. The routine is entered and left in machine language, but uses Floating Point Interpretive System 4, program H1-24.3 for all arithmetic.

INPUT

The elements of a square matrix are stored in consecutive locations in double precision floating point format beginning in  $M_0$ .

OUTPUT

The elements of the transposed matrix are stored in double precision floating point format beginning in  $M'_0$ .  $M'_0 = M_0$  or is sufficiently distant from  $M_0$  so that there is no overlap.

## MATRIX TRANSPOSE 4

### CALLING SEQUENCE

<u>Location</u>	<u>Order</u>	<u>Address</u>	<u>Notes</u>
a - 1	E	0000	
a	R	Lo	Initial location of this routine.
a + 1	U	Lo	
a + 2	Z	Lo	Initial location of interpretive routine.
a + 3	(n at 15)	Mo	Storage matrix A.
a + 4	Z	M'o	Storage matrix B.
a + 5	etc.		

The E0000 order in (a - 1) is required only if the previous instructions are interpreted by the source program. In (a + 3), the n is the order of the matrix.

### TIME

Approximately .8 n milliseconds are required.

### STORAGE

1 track, 32 sectors (96 words) are required for instructions and constants. No temporary storage is required.

D1-0151  
D1-439.4

Royal McBee Corporation  
ELECTRONIC COMPUTER DEPARTMENT

JOB # 0111

DOUBLE PRECISION FLOATING POINT MATRIX TRANSPOSE

FUNCTION

To transpose a square matrix. The transposed matrix will either replace the given matrix in memory or will be placed in another storage area. The routine is entered and left in machine language, but uses Double Precision Floating Point (DFFP) for all arithmetic.

INPUT

The elements of a square matrix stored in consecutive drum locations (in DFFP Form) beginning in Mo.

OUTPUT

The elements of the transposed matrix beginning in M'o. M'o=Mo or is sufficiently distant from Mo so that there is no overlap.

CALLING SEQUENCE

LOCATION	ORDER	ADDRESS	NOTES
a-1	E	0000	
a	R	Lo	Initial location of this routine
a + 1	U	Lo	Initial loc. DFFP
a + 2	Z	Lo	Initial loc. DFFP
a + 3	(n at 15)	Mo	Storage first matrix
a + 4	Z	M'o	Storage second matrix
a + 5	etc.		

The E0000 order in a - 1 is required only if the previous instructions are interpreted by the DFFP program. In a + 3, the n is the order of the matrix.

TIME

Approximately .8 n<sup>2</sup> seconds

STORAGE

1 1/2 tracks are required for instructions and constants. No temporary storage is used.



LGP-30 CODING SHEET

PREPARED FOR

JOB NO

0151

PROGRAM NO

PROGRAM PREPARED BY

h20

PROGRAM RECEIVED BY

CEO

PROJECT

(W.P.F.P.)

Interest Management

PROGRAM INPUT CODES

STOP

LOCATION

INSTRUCTION

OPERATION

ADDRESS

STOP

CONTENTS OF ADDRESS

NOTES

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION	OPERATION	ADDRESS	CONTENTS OF ADDRESS	NOTES
		00 0 0	BE				20 K to
		0 1	Y 0102				01 U to
		0 2	Y 0103				02 Z DEF1
		0 3	Y 0046				03 No's Mo
		0 4	Y 0047				04 Z Mo
		0 5	R 0000				05 etc
		0 6	A 0121				
		0 7	Y 0012				
		0 8	A 0023				
		0 9	Y 0028				
		1 0	A 0123				
		1 1	Y 0040				
		1 2	BE				
		1 3	Y 0048				
		1 4	Y 0104				
		1 5	Y 0106				
		1 6	E 0124				
		1 7	H 0117				
		1 8	M 0125				
		1 9	H 0131				
		2 0	A 0129				
		2 1	H 0130				
		2 2	B 0117				
		2 3	U 0024				
		2 4	M 0117				
		2 5	M 0118				
		2 6	B 0948				
		2 7	Y 0126				
		2 8	BE				
		2 9	Y 0049				
		3 0	Y 0107				
		3 1	Y 0109				

Royal McBee Corporation  
DATA PROCESSING DIV.  
PORT CHESTER, NEW YORK

LGP-30 CODING SHEET

PREPARED FOR

JOB NO  
0151

PROGRAM NO

PROGRAM PREPARED BY  
CH

PROGRAM CHECKED BY

PROJECT  
N 7 70

Matrix

Langone

DATE  
11-10-57  
PAGE

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION		STOP	CONTENTS OF ADDRESS	NOTE
			OPERATION	ADDRESS			
		0002		40046			
		003		R0048		M0	
		004		A0120		3(n+1)	
		005		Y0048			
		006		Y0104			
		007		Y0106			
		008		S0126		M0 + 3n <sup>2</sup>	
		009		T0041			
		010		UC		EXIT	
		011		R0049			
		012		A0120		3(n+1)	
		013		Y0049			
		014		Y0107			
		015		Y0109			
		016		RC		→ DPFP	
		017		UC			
		018		RC		M0	
		019		HC		M0	
		020		KE0000			
		021		R0104			
		022		A0131		3n @ 29	
		023		Y0104			
		024		S0126		M0 + 3n <sup>2</sup>	
		025		T0057		→ to inner loop	
		026		U0033		→ to register	
		027		R0106			
		028		A0130		3n @ 29	
		029		Y0106			
		030		R0107			
		031		A0131		3n @ 29	
		032		Y0107			
		033		Y0109			

CARRIAGE RETURN

FORM C-3073-58 NEW YORK

LGP-30 CODING SHEET

PREPARED FOR

PAGE 3 OF 3

JOB NO  
0151

PROGRAM NO

PROGRAM PREPARED BY  
P.H. *transpose*

PROGRAM CHECKED BY

DATE  
11-18-59

PROGRAM NAME  
*NO 770117 at of*

TRACK

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION		STOP	CONTENTS OF ADDRESS	NOTES
			OPERATION	ADDRESS			
		01					
		0 0	AO	129		3@29	
		0 1	AO	109			
		0 2	RC			→ APFP	
		0 3	UC			☒	
		0 4	RC				
		0 5	AO	113		temp	
		0 6	RC				
		0 7	HC			☒	
		0 8	AO	113		Temp	
		0 9	HC				
		1 0	XEO	000			
		1 1	UAOS	1		☒ loop	
		1 2					
		1 3					Temporary storage
		1 4					
		1 5				☒	
		1 6		10		1@27	
		1 7	C			N@15	
		1 8		6		3@30	
		1 9				☒	
		2 0	C			3(n+1)	
		2 1		4		1@29	
		2 2					
		2 3		4		☒ 1@19	
		2 4	UAO	000		extract	
		2 5	AO	000		3@14	
		2 6	RC			Mo + 3n <sup>2</sup>	
		2 7				☒	
		2 8					
		2 9				3@29	
		3 0				3@29	
		3 1	E			☒ 3n@29	

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