TITLE:	Extraction of the element with largest absolute value from each row of a matrix for use as communalities estimates
TYPE:	Entire program
SYMBOLS:	d - decimal digits in each element of the matrix
	n - order of the matrix
CAPACITY:	$1 \leq d \leq 9$; $2 \leq n \leq 900$
DURATION:	$n^2(.002d + .006) + n(.019d + .053)$ seconds

METHOD OF USE:

	Stops
1. Master tape	3400S
2. Parameters	2402T
3. Matrix tape	2400S

At stop 2400S additional problems can be run by repeating steps 2 and 3.

PARAMETERS: There are two parameters separated by fifth-hole characters in the following order:

d space n space

MATRIX TAPE: The data tape consists of $n(n + 1)/2$ signed fractions in triangular form as follows:

$r_{11}, r_{21}, r_{22}, \ldots r_{nn}.$

PURPOSE: The purpose of this routine is to select the largest element in absolute value (excluding the diagonal entry) from each row of the matrix to be factored. These are punched to d digits with a carriage return after each element and an N terminating symbol. For a large matrix in triangular form, it is difficult to select these values by inspection.

The rationale for using this selection as communalities estimates is that the length of a test vector can be estimated by its projection on the vector closest to it. Thurstone states that this "simple method of estimating communalities is useful only for large correlation matrices."

(<u>Multiple</u> <u>Factor</u> <u>Analysis</u>, Thurstone, L. L., page 300).

NOTE 1:   A stop on FF000 from location 043 indicates that a sum check failure in reading the master tape has occurred.

NOTE 2:   A stop on FF001 indicates that the parameter $d \geq 10$. By moving the white switch up and down, a new parameter can be read.

NOTE 3:   A stop on FF002 indicates that a sign digit is out-of-place. By moving the white switch up and down, the reading of the matrix will be continued.

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SUBMITTED BY _Kern Wm Dickman_
APPROVED BY _J M Snyder_

ns

LOCATION			ORDER		NOTES
Abs.	Rel.	Sym			
			007K		
7			80F 00F	by 8(1)	n - order of matrix
8			00F 00100F		location of communalities
9			12135F 41F	by 13(1)	
10			00F 0010F		
			00K		Read parameters
11	0	(1)	191F 401F	from 65,66	
			L56L 428L		
			41F 9259F		
			814F 225L		
			914F 325L		
			268L 50F		
			7410F S56F		
			40F 264L		
			L5F 42F		store d, n
			F58L 428L		
	10		L51F L41F		
			401F 362L		
			L58F 4214L		
			L47F 429F		
			92135F 41F	by 12L	Clear previous communalities
			F514L 4214L		
			L09F 3214L		
			L58F 4219(2)		
			413F 414F		
			503F L56F		
31	20		002F 4220(2)		Set d
			0020F 462(2)		
			L510F L06F		
			0022F 4620(2)		Set (10 - d)
			L56F L010F		
			3627L 416F		
			24(2) 00F		24027

Abs.	Rel.	Sym	ORDER		NOTES		
	27		FF1F 26L		FF001: $d \geq 10$		
			00K				
39	0	(2)	814F L010F				
			362L FF2F		FF002: no sign		
			81F 405F	by 21(1)			
			L53F L04F				
			40F L3F				
			3216L L58F		Test for diagonal		
			L43F 429L				
			4211L L58F				
			L44F 4212L				
			4214L L5F		Test row i		
	10		L05F 3212L				
50	11		L55F 40F				
			2212L L5F				
			L05F 3615L		Test row j		
			L55F 40F				
			F54F 424F				
			26L 414F				
			F53F 423F				
			L07F 36L				
			92642F L5F	by 17(1)	Punch + sign and d digits		
59	20		00F 82F	by 23,20(1)			
			92131F 92515F				
			F519L 4219L				
			F56F 426F				
			L07F 3619L				
			92770F 92135F				
65	26		921001F 24(1)		End at 2400S		
			00K				
			L3F 34(1)		Sum check		
			FFF 26(1)				
			L8627F7K 3839F				
			26L 261N				