

UNIVERSITY OF ILLINOIS  
DIGITAL COMPUTER

AUXILIARY  
LIBRARY ROUTINE V 17 - 328

TITLE: Reciprocal Gamma Function for Real Argument (DOI or SADOI)  
TYPE: Closed subroutine, standary entry  
NUMBER OF WORDS: 26  
TEMPORARY STORAGE: 0, 1  
ACCURACY:  $\pm 2^{-35}$ ; errors usually less than  $10^{-11}$   
DURATION: 17.2 milliseconds  
DESCRIPTION: This routine is entered with X in A and link in Q.

When the link is obeyed,

$$\frac{1}{\Gamma(x)} = x(x+1) [1 + B_1 x + B_2 x^2 + \dots]$$

is in the accumulator, and x is at location zero. The variable x may lie in  $-1 \leq x < 1$ .

NOTE: The Gamma function for other values of x may be computed using the relations

$$\frac{1}{\Gamma(x+1)} = \frac{1}{x} \frac{1}{\Gamma(x)} \quad \text{and}$$

$$\frac{1}{\Gamma(x-1)} = \frac{x-1}{\Gamma(x)}, \text{ as well as many}$$

other relations which can be found in standard reference works on higher transcendental functions.

DATE August 15, 1961
PROGRAMMED BY John Ehrman
APPROVED BY <i>K. Dickman</i>

LOCATION	ORDER		NOTES	PAGE 1	V 17
0	40 F K5 14L		Store x at 0		
1	42 11L L5 L				
2	42 3L 50 13L		initialize coefficient address		
3	7J F L4 F	by 2,5'			
4	40 1F 50 1F				
5	F5 3L 42 3L				
6	L0 12L 36 3L		End test		
7	7J F 40 1F				
8	50 1F 7J F				
9	L4 F 40 1F				
10	50 1F 7J F				
11	L4 1F 22 F	by 1			
12	LJ F L4 26L		End constant		
13	LL 4095F F5 2773F		$B_{13} = -.000000181220$		
14	00 F S2 1292F		$B_{12} = +.000001328554$		
15	LL 4094F 9L 2383F		$B_{11} = -.000002625721$		
16	LL 4086F NL 1814F		$B_{10} = -.000017527917$		

LOCATION	ORDER		NOTES	PAGE 2	V 17
17	00 76F 59 1499F		$B_9 = +.000145624324$		
18	LL 3906F NL 1360F		$B_8 = -.000360851496$		
19	LL 3674F 4S 547F		$B_7 = -.000804341335$		
20	01 110F 82 653F		$B_6 = +.008023278113$		
21	LJ 3036F NL 2838F		$B_5 = -.017645242118$		
22	LN 3511F 6N 1869F		$B_4 = -.024552490887$		
23	18 1882F N5 1798F		$B_3 = +.191091101162$		
24	F2 671F NO 1204F		$B_2 = -.233093736365$		
25	N9 3619F 3L 450F		$B_1 = -.422784335092$		