

DATA OUTPUT "30"

Program No. J4-173



GENERAL PRECISION, INC. / COMMERCIAL COMPUTER DIVISION

TITLE: Data Output "30"

AUTHOR: Richard A. Lamm

INSTALLATION: Lederle Laboratories, Pearl River, New York

CLASSIFICATION: J

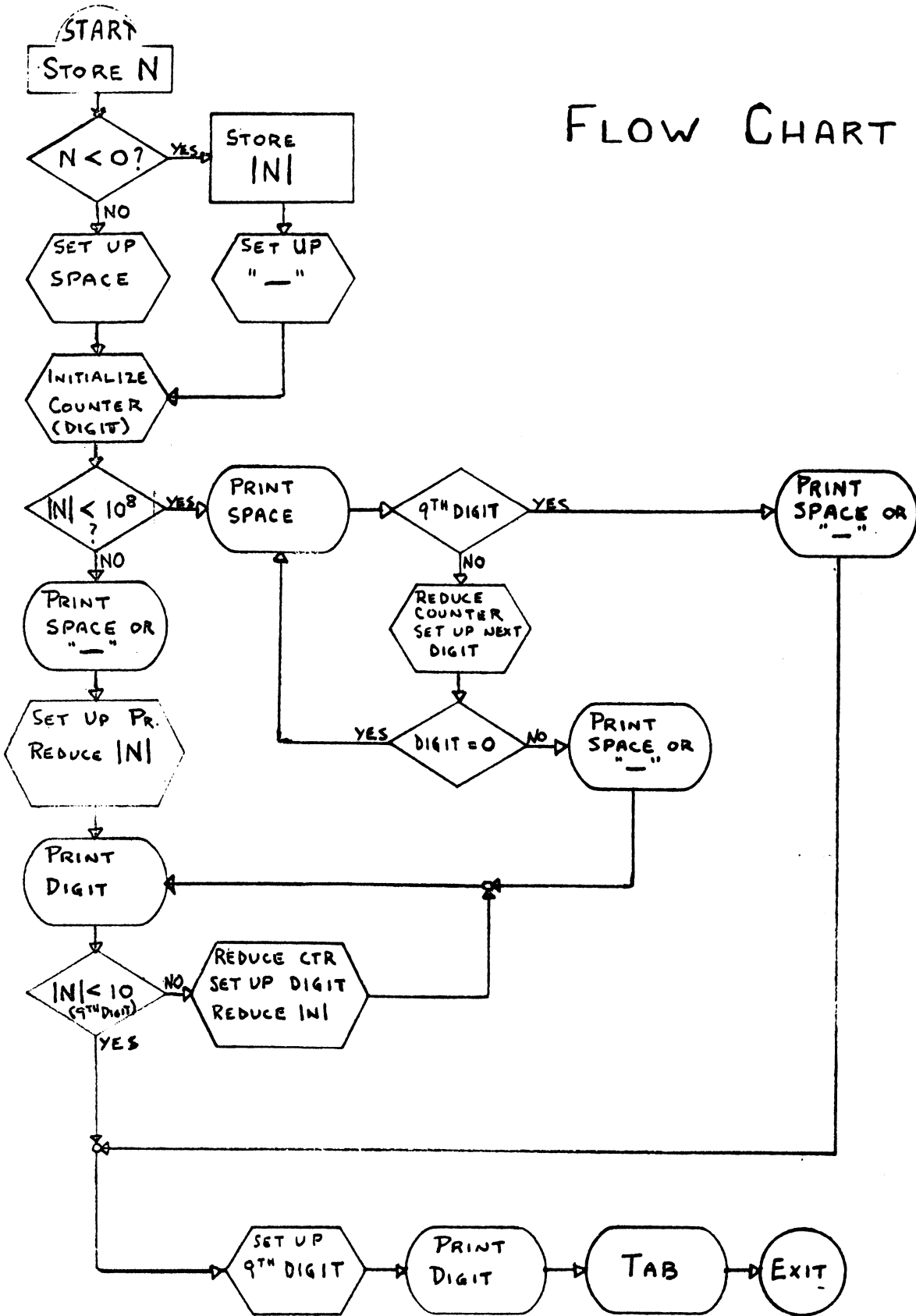
ABSTRACT:

This routine converts a number to decimal and prints nine decimal digits. Leading zeros are suppressed. No decimal point is printed. The number acted upon is in the accumulator at $q = 30$.

DISCLAIMER:

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FLOW CHART



1. Title: Data Output "30"
 Author: Richard A. Lamm
 Date: December 21, 1959
 Installation: Lederle Laboratories, Pearl River, New York
 Classification: J
2. Purpose: To convert to decimal and print a number in the accumulator at $q = 30$. Conversion is exact for $|N| \leq 2^{30} - 1$.
3. Restriction: If $|N| \geq 1,000,000,000$ it will print out as fxx,xxx,xxx .
4. Input: Number in the accumulator at $q = 30$.
5. Calling Sequence:

<u>Location</u>	<u>Order</u>	<u>Address</u>
α	R	$Lo + 151$
$\alpha + 1$	U	Lo
$\alpha + 2$	etc.	
6. Output: Space or - and nine decimal digits. There is no decimal point printed. Leading zeros are suppressed and spaces are executed in their place. The number zero is printed as 0 .
7. Storage: 116 sectors. There is no external storage.
8. Timing: 1.0 to 1.5 seconds per number, excluding the time required to execute the Tab.

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LGP-30 CODING SHEET

PREPARED FOR: LGP-30/RPC-4000 Users' Organization - POOL			PAGE OF 1 / 4
JOB NO.	PROGRAM NO. J4-173	PROGRAM PREPARED BY: R. A. LAMM	PROGRAM CHECKED BY: POOL Review
PROBLEM: DATA OUTPUT "30"			DATE 12/21/59
			TRACK

PROGRAM INPUT CODES	STOR	LOCATION	INSTRUCTION		STOR	CONTENTS OF ADDRESS	NOTES
			OPERATION	ADDRESS			
3,000 L ₀ /0,00 L ₀		⊗					CALLING SEQUENCE: R L ₀ +151 U L ₀
		0,0,0,0	H	0,1,5,0			STORE N @ 30
		0 1	T	0,1,0,6			→ N negative
		0 2	U	0,0,0,3			
		0 3	B	0,0,3,9	⊗	xZ0313	"space"
		0 4	Y	0,0,4,0			
		0 5	Y	0,1,2,7			
		0 6	Y	0,0,2,1			
		0 7	U	0,0,1,2	⊗		
3,000,000,0,1		0 8		4,0,0,0			4 @ 19
		0 9	xP	0,6,1,8			SEE 0023
		1 0	xZ	0,0,0,1			1 @ 29
		1 1			⊗		
		1 2	B	0,0,5,5		xZ0007	DIGIT
		1 3	C	0,0,6,3			COUNTER
		1 4	B	0,1,5,0		INI	
		1 5	M	0,0,5,1	⊗	1 @ 1	
		1 6	D	0,0,5,2		100,000,000 @ 27	
		1 7	E	0,1,3,9		7800 0000	
		1 8	H	0,0,6,1		TEMP. STORAGE	
		1 9	S	0,0,6,2	⊗	1 @ 4	
		2 0	T	0,1,1,2			→ INI < 10 ⁸
		2 1	P	[]			0313 0713 SPACE OR "-"
		2 2	M	0,0,0,8		4 @ 19	
		2 3	A	0,0,0,9	⊗	xP0618	
		2 4	C	0,0,3,2		PE]	
		2 5	S	0,0,6,1		T.S.	
		2 6	M	0,1,4,8		10 ⁸ @ 27	
		2 7	N	0,1,3,5	⊗	1 @ 30	SHIFT LEFT 1 bit
		2 8	A	0,1,5,0		INI	
		2 9	C	0,1,5,0		INI	REDUCED INI
		3 0	B	0,0,6,3			COUNTER
		3 1	S	0,0,1,0	⊗	1 @ 29	

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PREPARED FOR: LGP-30/RPC-4000 Users' Organization - POOL				PAGE OF 2/4
JOB NO.	PROGRAM NO J4-173	PROGRAM PREPARED BY K.A.L.	PROGRAM CHECKED BY: POOL Review	DATE
PROBLEM: Data Output: "30"				TRACK

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION		STOP	CONTENTS OF ADDRESS	NOTES
			OPERATION	ADDRESS			
		0,0,3,2	PL				SEE 0024, 0130
		3,3	T,0,0,4,1				→ LAST DIGIT
		3,4	H,0,0,6,3				COUNTER
		3,5	A,0,0,5,7		<input checked="" type="checkbox"/>	Lo of 10' =	20141
		3,6	Y,0,1,0,1			D[10 ^c]	
		3,7	Y,0,1,3,3			M[10 ^c]	
		3,8	U,0,1,0,0				
		3,9	xZ,0,3,1,3		<input checked="" type="checkbox"/>		DELAY
		4,0	PL				SPACE OR " - "
		4,1	B,0,0,5,6			4 @ 24	
		4,2	N,0,1,5,0				
		4,3	A,0,0,4,7		<input checked="" type="checkbox"/>	xZ,0,2,0,0	
		4,4	Y,0,0,4,6				
0,0,0,0,0,0,1		4,5	7,8,0,0,0,0,0				EXT. MASK, DELAY
		4,6	PL				LAST DIGIT PRINT
		4,7	xZ,0,2,0,0		<input checked="" type="checkbox"/>		DELAY
		4,8	xP,2,4,0,0				TAB
		4,9	U,0,1,5,0				
0,0,0,0,0,0,7		5,0	4,0,0,0				4 @ 19
		5,1	4,0,0,0,0,0,0		<input checked="" type="checkbox"/>		1 @ 1
		5,2	5W,5,0,1,0,0,0				10 ⁸ @ 27
		5,3	[]				TEMP STORAGE
		5,4	8,0,0,0,0,0,0				1 @ 4
		5,5	I, J		<input checked="" type="checkbox"/>		7 @ 29
		5,6	2,0,0				4 @ 24
		5,7	Z,0,1,4,1				Loc 10'
		5,8	xP,0,6,1,8				
		5,9			<input checked="" type="checkbox"/>		
		6,0	Z,0,1,4,1				Loc 10'
0,0,0,0,0,0,3		6,1	[]				TEMP STORE
		6,2	8,0,0,0,0,0,0				1 @ 4
		6,3	[]		<input checked="" type="checkbox"/>		COUNTER

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PREPARED FOR: LGP-30/RPG-4000 Users' Organization - POOL				PAGE OF 3 / 4
JOB NO.	PROGRAM NO. J4-173	PROGRAM PREPARED BY: R.A.L.	PROGRAM CHECKED BY: POOL Review	DATE 12/21/59
PROBLEM: DATA OUTPUT '30'				TRACK

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION		STOP	CONTENTS OF ADDRESS	NOTES
			OPERATION	ADDRESS			
		<input checked="" type="checkbox"/>					
		0 1 0 0	B	0150		INI	
		0 1	D			Loc 10 ^c	
		0 2	E	0045			
		0 3	H	0053	<input checked="" type="checkbox"/>		
		0 4	S	0054			
		0 5	U	0128			
		0 6	M	0149		-1@0	HERE FOR N NEG.
		0 7	C	0150	<input checked="" type="checkbox"/>	INI	
		0 8	B	0137		x20713	"-" for PRINT
		0 9	U	0004			
00000002		1 0					
		1 1	8	000000	<input checked="" type="checkbox"/>		1@4
		1 2	xP	0362			
		1 3	B	0063			COUNTER
		1 4	S	0136		1@29	
		1 5	T	0039	<input checked="" type="checkbox"/>		→ LAST DIGIT
		1 6	H	0063			CTR
		1 7	A	0060		Loc 10'	
		1 8	Y	0133			
		1 9	Y	0122	<input checked="" type="checkbox"/>		
		2 0	U	0121			
		2 1	B	0150		INI	
		2 2	D			10 ^c	
		2 3	E	0045	<input checked="" type="checkbox"/>	78000000	
		2 4	H	0053			T. STORAGE
		2 5	S	0111		1@4	
		2 6	T	0112			
		2 7	P		<input checked="" type="checkbox"/>		SPACE OR "-"
		2 8	M	0050		4@19	
		2 9	A	0058		xP0618	
		3 0	C	0032			
		3 1	S	0053	<input checked="" type="checkbox"/>	T.S.	

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PREPARED FOR: LGP-30/RPC-4000 Users' Organization - POOL			PAGE 4 OF 4
JOB NO.	PROGRAM NO. JL-173	PROGRAM PREPARED BY. R.	PROGRAM CHECKED BY: POOL Reivew
PROBLEM: Data Output "30"			DATE 12/21/59
			TRACK

PROGRAM INPUT CODES	STOP	LOCATION	INSTRUCTION		STOP	CONTENTS OF ADDRESS	NOTES
			OPERATION	ADDRESS			
		0,1,3,2	U	0,1,3,3			
		3,3	M	[10 ^c	
		3,4	U	0,0,2,2			
0,0,0,0,0,1,7		3,5		2	×	1 @ 30	
		3,6		4		1 @ 29	
		3,7		7,3,4		XZ0713	
		3,8					
		3,9	7,8,0,0,0,0,0,0		×		
		4,0					
		4,1		1,4,0		10 ¹ @ 26	
		4,2		J,8,0		10 ²	
		4,3		7,K,0,0	×	10 ³	
		4,4		4,Q,2,0,0		10 ⁴	
		4,5		3,0,K,4,0,0		10 ⁵	
		4,6		1,Q,8,4,8,0,0		10 ⁶	
		4,7		1,3,1,2,K,0,0,0	×	10 ⁷	
		4,8		5,W,5,Q,1,0,0,0		10 ⁸ @ 27	
		4,9		8,0,0,0,0,0,0,0		- 1 @ 0	
		5,0		[INI	
		5,1		U[α+2]	×	EXIT	
0,0,0,0,0,0,0,0		5,2					
		5,3					
		5,4					
		5,5			×		
		5,6					
		5,7					
		5,8					
		5,9			×		
		6,0					
		6,1					
		6,2					
		6,3			×		