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BOOTSTRAP FOR CLEAR ,008015,022026,030040/019,001L020100 ,047054,061068,072072)0810811022 1
CLEAR OR BOOTSTRAP ,008047/047046 /000H025B022100 4/047046,054061,068072,0010401040 2

      COMPUTE MERSENNE PRIME 23 = 2**11213 - 1                                MERSN                PAGE 1

SEQ PG LIN LABEL OP OPERANDS SFX CT LOCN INSTRUCTION TYPE CARD
101          JOB COMPUTE MERSENNE PRIME 23 = 2**11213 - 1
102          CTL 6611
103          *
104          * COMPUTE THE 23RD MERSENNE PRIME = 2**11213 - 1. WE START
105          * WITH THE 6 THAT'S THE LOW-ORDER DIGIT OF 2**4 IN THE
106          * NUMBER. THE OVFL LOOP ADDS A HIGH-ORDER 1 TO MAKE 16.
107          * THEN IT PROCEEDS BY DOUBLING FROM THEN, WITH THE OVERFLOW
108          * LOOP MOVING OVER THE HIGH-ORDER DIGIT WORD MARK, AND
109          * PUTTING IN A 1. WE DON'T NEED TO CLEAR THE OVERFLOW ZONE,
110          * BECAUSE THE NEXT DOUBLING WILL DO IT.
111          *
112          ORG 081                                0081
113          WHAT DCW @0001: @ STARTING DIGIT NUMBER PRINT FIELD 6 0086 3
114          *
115          * X1 IS USED TO KEEP TRACK OF THE CURRENT HIGH-ORDER DIGIT
116          * (ACTUALLY ONE CHARACTER BEFORE IT). AT THE END, IT'S ONE
117          * BEFORE THE HIGH-ORDER DIGIT FOR THE WHOLE NUMBER. THEN,
118          * IT'S USED TO PRINT THE RESULT, BEING INCREMENTED BY 100 FOR
119          * EACH LINE.
120          *
121          X1 DSA NUMBER-1 INITIAL CONTENT OF X1, AT 87-89 3 0089 G07 3
122          *
123          * COMPUTE THE 23RD MERSENNE PRIME. THIS CODE RUNS THROUGH X2
124          * AND X3, AND INTO THE PUNCH AREA, BUT WE'RE NOT USING X2 OR
125          * X3, OR PUNCHING, SO WE MIGHT AS WELL USE IT.
126          *
127          START W PRINT THE TITLE PRELOADED AT 201-... 1 0090 2 3
128          OVFL CW 1&X1 CLEAR WM TO MAKE MORE ROOM 4 0091 ) 0'1 3
129          LCA ONE DO THE OVERFLOW, SET THE WM 4 0095 L 198 3
130          SBR X1 HIGH-ORDER DIGIT INDEX - 1 4 0099 H 089 3
131          INNER BWZ DONE,NDOUBL,K DONE IF NEGATIVE 8 0103 V 131 G37 K 3
132          S ONE,NDOUBL 7 0111 S 198 G37 4
133          A NUMBER DOUBLE IT 4 0118 A G08 4
134          BAV OVFL OVERFLOW? 5 0122 B 091 Z 4
135          B INNER NO 4 0127 B 103 4
136          DONE S ONE,NUMBER PUTS A ZONE ON LOW-ORDER DIGIT 7 0131 S 198 G08 4
137          MZ ONE,NUMBER CLEAR ZONE ON LOW-ORDER DIGIT 7 0138 Y 198 G08 4
138          *
139          * PRINT IT
140          *
141          SW 207 4 0145 , 207 4
142          LCA WHAT 4 0149 L 086 5
143          PLOOP SBR X1,100&X1 BUMP PRINTING INDEX BY 100 7 0153 H 089 1'0 5
144          MCS WHAT-2,204 INDEX OF FIRST DIGIT 7 0160 Z 084 204 5
145          A ONE,WHAT-4 ADD 100 TO DIGIT NUMBER TO PRINT 7 0167 A 198 082 5
146          MCW 0&X1,306 NEXT HUNDRED DIGITS 7 0174 M 0'0 306 5
147          W PRINT THEM 1 0181 2 5

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SEQ	PG	LIN	LABEL	OP	OPERANDS	SFX	CT	LOCN	INSTRUCTION	TYPE	CARD
COMPUTE MERSENNE PRIME 23 = 2**11213 - 1											
						MERSN		PAGE		2	
148			BCE		FINIS,306, DONE IF BLANK IN PRINT AREA	8		0182	B 194 306		6
149			B		PLOOP PRINT 100 MORE DIGITS	4		0190	B 153		6
150			FINIS	H	FINIS HALT LOOP (AS GOOD HERE AS ANYWHERE)	4		0194	. 194		6
151			ONE	DCW	1	1		0198			6
152			*								
153			ORG		201 PRE-LOAD TITLE INTO PRINT AREA				0201		
154			DCW		@23RD MERSENNE PRIME = 2**11213 - 1@	34		0234			7
155			*								
156			*		HERE'S THE NUMBER						
157			*								
158			ORG		333				0333		
159			DA		1X3375			0333	3707		
160			NUMHI		1,1 HIGH-ORDER DIGIT			0333		FIELD	
161			NUMBER	DCW	6 LOW-ORDER DIGIT	1		3708			8
162				DC	#24 BLANKS FOR PRINTING THE LAST LINE	24		3732			8
163			*								
164			NDOUBL	DCW	11208 EXPONENT - 4 - 1	5		3737			8
165				END	START				/ 090 080		

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COMPUTE MERSENNE PRIME 23 = 2**11213 - 1

MERSN

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SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS
DONE	131	FINIS	194	INNER	103	NDOUBL	3737	NUMBER	3708	NUMHI	333	ONE	198
OVFL	91	PLOOP	153	START	90	WHAT	86	X1	89				