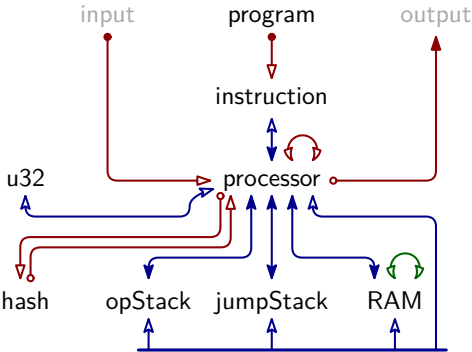


2	$\ominus$	pop	- st <sub>0</sub>	-
1	$\oplus$	push + a	-	- a
8	$\oplus$	divine	-	- a
9	$\oplus$	dup + i	- st <sub>15</sub> ... st <sub>0</sub>	- st <sub>15</sub> ... st <sub>0</sub> st <sub>i</sub>
17	$\bigcirc^{16}$	swap + i	- ... st <sub>i</sub> ... st <sub>0</sub>	- ... st <sub>0</sub> ... st <sub>i</sub>
16	$\bigcirc$	nop	-	-
10	$\ominus$	skiz	- st <sub>0</sub>	-
25	$\bigcirc$	call + d	-	-
24	$\bigcirc$	return	-	-
32	$\bigcirc$	recurse	-	-
18	$\ominus$	assert	- st <sub>0</sub>	-
0	$\bigcirc$	halt	-	-
40	$\bigcirc^1$	read_mem	- addr st <sub>0</sub>	- addr val
48	$\bigcirc$	write_mem	- addr val	- addr val
56	$\bigcirc^{10}$	hash	- st <sub>9</sub> ... st <sub>0</sub>	- d <sub>4</sub> ... d <sub>0</sub> 0 ... 0
64	$\bigcirc^{11}$	divine_sibling	- idx st <sub>9</sub> ... st <sub>5</sub> d <sub>4</sub> ... d <sub>0</sub>	- idx >> 1 r <sub>4</sub> ... r <sub>0</sub> l <sub>4</sub> ... l <sub>0</sub>
72	$\bigcirc$	assert_vector	-	-
26	$\ominus^1$	add	- st <sub>1</sub> st <sub>0</sub>	- sum
34	$\ominus^1$	mul	- st <sub>1</sub> st <sub>0</sub>	- prod
80	$\bigcirc^1$	invert	- st <sub>0</sub>	- st <sub>0</sub> <sup>-1</sup>
42	$\ominus^1$	eq	- st <sub>1</sub> st <sub>0</sub>	- (st <sub>0</sub> == st <sub>1</sub> )
4	$\oplus^2$	split	- st <sub>0</sub>	- lo hi
12	$\ominus$	lt	- st <sub>1</sub> st <sub>0</sub>	- (st <sub>0</sub> < st <sub>1</sub> )
20	$\ominus$	and	- st <sub>1</sub> st <sub>0</sub>	- (st <sub>0</sub> & st <sub>1</sub> )
28	$\ominus$	xor	- st <sub>1</sub> st <sub>0</sub>	- (st <sub>0</sub> ^ st <sub>1</sub> )
36	$\bigcirc$	log_2_floor	- st <sub>0</sub>	- $\lfloor \log_2(st_0) \rfloor$
44	$\ominus$	pow	- e b	- b <sup>e</sup>
52	$\ominus$	div	- denom num	- quot rem
88	$\bigcirc^3$	xxadd	- y <sub>2</sub> y <sub>1</sub> y <sub>0</sub> x <sub>2</sub> x <sub>1</sub> x <sub>0</sub>	- y <sub>2</sub> y <sub>1</sub> y <sub>0</sub> z <sub>2</sub> z <sub>1</sub> z <sub>0</sub>
96	$\bigcirc^3$	xxmul	- y <sub>2</sub> y <sub>1</sub> y <sub>0</sub> x <sub>2</sub> x <sub>1</sub> x <sub>0</sub>	- y <sub>2</sub> y <sub>1</sub> y <sub>0</sub> z <sub>2</sub> z <sub>1</sub> z <sub>0</sub>
104	$\bigcirc^3$	xinvert	- x <sub>2</sub> x <sub>1</sub> x <sub>0</sub>	- y <sub>2</sub> y <sub>1</sub> y <sub>0</sub>
50	$\ominus^3$	xbmul	- x <sub>2</sub> x <sub>1</sub> x <sub>0</sub> b	- y <sub>2</sub> y <sub>1</sub> y <sub>0</sub>
112	$\oplus$	read_io	-	- a
58	$\ominus$	write_io	- st <sub>0</sub>	-

Table	Base Columns																										
Program	Address				Instruction		IsPadding																				
Instruction	Address				CI	NIA	IsPadding																				
Processor	CLK	IsPadding	IP	PI	CI	NIA	IB0	...	IB6	JSP	JS0	JSD	ST0	...	ST15	OSP	OSV	HV0	...	HV3	RAMP	RAMV					
OpStack	CLK	clk.di	IB1 ( $\hat{=}$ shrink stack)												OSP	OSV											
RAM	CLK	clk.di	PI		bcpc0		bcpc1												RAMPDiffInv							RAMP	RAMV
JumpStack	CLK	clk.di			CI					JSP	JS0	JSD															
Hash	RoundNumber												ST0	...	ST15	CONSTANT0A		...	CONSTANT15B								

#clk	instruction
2	neg
4	sub
68	is_u32
139	split_assert
146	lte
148	lt
295	and
301	xor
195	reverse
164	div



$p = 18446744069414584321$		
$i$	$\mathbb{F}_p(1/i)$	$-\mathbb{F}_p(1/i)$
2	092...161	922...160
3	122...881	614...440
4	138...241	461...080
5	147...457	368...864
6	153...601	307...720

	base	ext	$\Sigma$
Program	3	1	4
Instruction	4	2	6
Processor	43	11	54
OpStack	5	2	7
RAM	8	6	14
JumpStack	6	2	8
Hash	49	2	51
$\Sigma$	118	26	144

	init	cons	trans	term	$\Sigma$
Program	2	1	3		6
Instruction	3	1	5		9
Processor	37	11	75	2	125
OpStack	5		6		11
Ram	8		14	1	23
JumpStack	6		8		14
Hash	3	38	21		62
Cross-Table				1	1
$\Sigma$	64	51	132	4	251