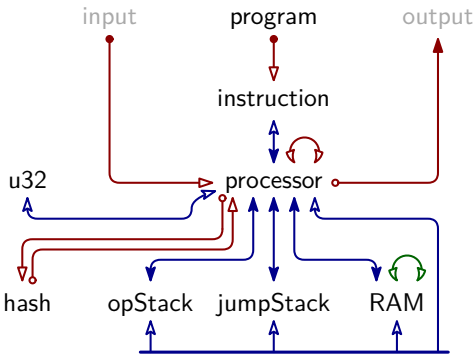


2	$\ominus$	pop	- st <sub>0</sub>	-
1	$\oplus$	push + a	-	- a
8	$\oplus$	divine	-	- a
9	$\oplus$	dup + i	- st <sub>15</sub> ... st <sub>0</sub>	- st <sub>15</sub> ... st <sub>0</sub> st <sub>i</sub>
17	$\bigcirc^{16}$	swap + i	- ... st <sub>i</sub> ... st <sub>0</sub>	- ... st <sub>0</sub> ... st <sub>i</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	$\ominus^1$	lt	- st <sub>1</sub> st <sub>0</sub>	- (st <sub>0</sub> <st <sub>1</sub> )
20	$\ominus^1$	and	- st <sub>1</sub> st <sub>0</sub>	- (st <sub>0</sub> &st <sub>1</sub> )
28	$\ominus^1$	xor	- st <sub>1</sub> st <sub>0</sub>	- (st <sub>0</sub> ^st <sub>1</sub> )
36	$\bigcirc^1$	log_2_floor	- st <sub>0</sub>	- $\lfloor \log_2(st_0) \rfloor$
44	$\ominus^1$	pow	- e b	- b <sup>e</sup>
52	$\bigcirc^2$	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					
U32	CF	Bits	Bits-33_inv	CI	LHS	RHS	LT	AND	XOR	Log2Floor	Pow	LHS_inv	RHS_inv											

#clk	instruction
2	neg
4	sub
7	is_u32
3	lsb



$$p = 18446744069414584321$$

$i$	$\mathbb{F}_p(1/i)$	$-\mathbb{F}_p(1/i)$
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	12	55
OpStack	5	2	7
RAM	8	6	14
JumpStack	6	2	8
Hash	49	2	51
U32	14	1	15
$\Sigma$	132	28	160

	init	cons	trans	term	$\Sigma$
Program	2	1	3		6
Instruction	3	1	5		9
Processor	38	11	76	2	127
OpStack	5		6		11
Ram	8		14	1	23
JumpStack	6		8		14
Hash	3	38	21		62
U32	2	13	22	2	39
Cross-Table				1	1
$\Sigma$	67	64	155	6	292