



Processor Design

Name	BN	SEC
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Opcode & bits details

Instruction		Opcode	
INSTR Opcode			
Op code			
5		11	
NOP		00000 --- 0	
RET		00001 --- 1	
RTI		00010 --- 2	
INSTR Opcode – Rdst			
Op code	Rdst		
5	3	8	
NOT		00011 --- 3	
NEG		00100 --- 4	
INC		00101 --- 5	
DEC		00110 --- 6	
OUT		00111 --- 7	
IN		01000 --- 8	
PUSH		01001 --- 9	
POP		01010 --- 10	
PROTECT		01011 --- 11	
FREE		01100 --- 12	
JZ		01101 --- 13	
JMP		01110 --- 14	
CALL		01111 --- 15	

INSTR Opcode – Rdst -Rsrc1 -Rsrc2



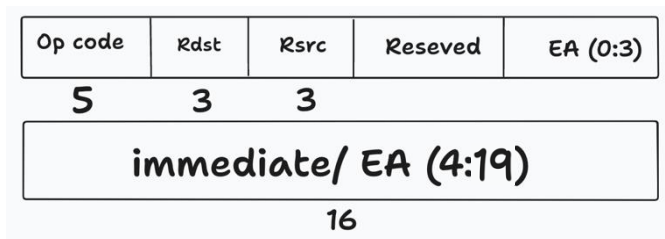
ADD	10000 --- 16
SUB	10001 --- 17
AND	10010 --- 18
OR	10011 --- 19
XOR	10100 --- 20

INSTR Opcode - R - R



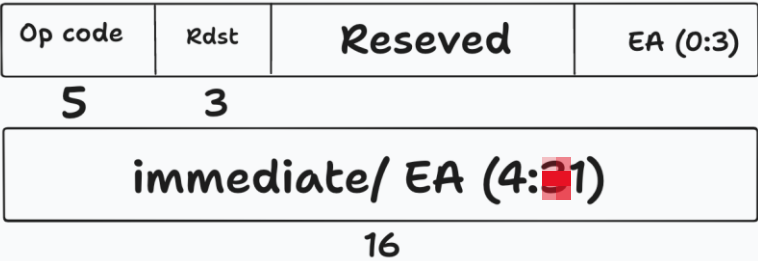
SWAP	10101 --- 21
CMP	10110 --- 22

INSTR Opcode Rdst - Rsrc - (Imm/EA)



ADDI	10111 --- 23
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INSTR Opcode - Rdst - Imm



BITSET	11000 --- 24
RCL	11001 --- 25
RCR	11010 --- 26
LDM	11011 --- 27
LDD	11100 --- 28
STD	11101 --- 29

Control Signal Table

<https://docs.google.com/spreadsheets/d/120m1b6FrHCg9PQZ74T6VtSyrkmBFBvLhuMwCTFt1aC0/edit?usp=sharing>

Schematic diagram

<https://www.tldraw.com/v/dJRQImzGx5PjeXC4-ebE3?viewport=-9750,-7814,6488,3678&page=page:page>

GitHub Repository

<https://github.com/MohamedMaher02/QuantumPipe>