Tim’s old CPU

# > Instruction Set <

SYS - System controls

0000 xxxa xxxx xxxx

a: flag to shut off system clock.

STOR - Writes from input to memory address.

0001 aaaa bbbb xxxx

a: 4-bit address to write to.

b: 2-bit input source select.

COPY – Copies a value from memory to a different address.

0010 aaaa bbbb cdxx

a: 4-bit address to read. Ignored if #c is 1.

b: 4-bit address to write. Ignored if #d is 1.

c: 1-bit ALU accumulator read flag. Ignored if #d=1 or #a!=0.

d: 1-bit Shifter read flag. Ignored if #c=1 or #a!-0.

CLR - Clears a memory address.

0011 aaaa xbcd xxxx

a: 4-bit address to clear. Ignored if #b is not 0.

b: 1-bit ALU accumulator reset flag.

c: 1-bit Shifter memory reset flag.

d: 1-bit Conditional flag reset.

ALU - ALU operations. Result is wrote to ALU memory.

0100 aaaa xxxx xxxx

a: 4-bit operation to perform.

0000: Nothing

0001: Increment A

0010: Decrement A

0011: Negate A

0100: OR A | B

0101: AND A & B

0110: XOR A ^ B

0111: NOR A !| B

1000: NAND A !& B

1001: XNOR A !^ B

1010: 2’s Compliment A

1011: Bit Counter A

1100: Subtract A - B

1101: Square A

1110: Square Root A

1111: Random Number

SHFT – Shift bits

0101 aaaa xxbc xxxx

a: 4-bit shift amount.

b: 1-bit rotate flag (doesn’t work).

c: Left shift flag.

RGET – Gets value from external memory. (doesn’t work).

0110 xxxx xxxx xxxx

RSET – Gets value to external memory. (doesn’t work).

0111 xxxx xxxx xxxx

COND - Custom Expansion 1. (The expansion will need its own decoder for the

1000 ???? ???? ???? arguments.)

JUMP – Jump to program address if conditional flag is true.

1001 ??aa aaaa ????

a: 6-bit location to jump to.

SREG – Set ALU Register

1001 xxxx xxxx xxxx

a: 6-bit location to jump to.

# > Example Programs <

### Addition

Index Raw Binary Hex SZG-Code

00 0001 0000 0000 0000 10 00 STOR i0,$0