## Stage #2

Instruction[pc]=[opcode,reg,reg,reg,imm]

DataMemory[addr]=[read data, write data]

Signals C-R-Sw-Disp[clock,reset,switch0,display]

\* Recall data memory addr = ALU output

```
Instr
          x]=[000,000,0000,000,000] DataMem[
                                                            0.
                                                                  x] C-R-Sw-Dsp[0,0,1,xxxxxxx]
                                                   x]=[x
Instr[
          x = [000,000,0000,000,000] DataMem[
                                                   x]=[
                                                            0,
                                                                  x] C-R-Sw-Dsp[1,0,1,xxxxxxx]
Instr[
          x]=[000,000,0000,000,000] DataMem[
                                                   x=[x]
                                                                  x] C-R-Sw-Dsp[0,1,1,xxxxxxx]
                                                            0,
Instr[
          0]=[110,000,0011,111,010] DataMem[
                                                   3]=[
                                                                  x] C-R-Sw-Dsp[1,1,1,xxxxxxxx]
                                                            0,
                                                                  x] C-R-Sw-Dsp[0,0,1,xxxxxxxx]
          0]=[110,000,0011,111,010] DataMem[
Instr[
                                                   3]=[
                                                            0,
Instr[
          2]=[000,111,0000,111,100] DataMem[
                                                   ]=[0
                                                                  0] C-R-Sw-Dsp[1,0,1,xxxxxxx]
                                                            0,
          2]=[000,111,0000,111,100] DataMem[
Instr[
                                                   ]=[0
                                                            0.
                                                                  0] C-R-Sw-Dsp[0,0,1,xxxxxxx]
          4]=[101,111,1110,000,010] DataMem[
                                                   3]=[
                                                                  3] C-R-Sw-Dsp[1,0,1,xxxxxxxx]
Instr[
                                                            0,
          4]=[101,111,1110,000,010] DataMem[
Instr[
                                                   3]=[
                                                            0,
                                                                  3] C-R-Sw-Dsp[0,0,1,xxxxxxx]
          6]=[110,000,0101,100,100] DataMem[
                                                    5]=[
                                                                  x] C-R-Sw-Dsp[1,0,1,xxxxxxx]
Instr[
                                                            0,
          6]=[110,000,0101,100,100] DataMem[
                                                    5]=[
                                                                  x] C-R-Sw-Dsp[0,0,1,xxxxxxx]
Instr[
                                                            0,
Instr
          8]=[110,111,1111,010,010] DataMem[
                                                    2]=[
                                                                  0] C-R-Sw-Dsp[1,0,1,xxxxxxx]
                                                            0.
          8]=[110,111,1111,010,010] DataMem[
                                                   2]=[
Instr[
                                                            0,
                                                                  0] C-R-Sw-Dsp[0,0,1,xxxxxxx]
         10]=[101,111,1101,000,111] DataMem[
                                                    ]=[0
                                                                  0] C-R-Sw-Dsp[1,0,1,xxxxxxx]
Instr[
                                                            0,
Instr[
         10]=[101,111,1101,000,111] DataMem[
                                                    ]=[0
                                                            0,
                                                                  0] C-R-Sw-Dsp[0,0,1,xxxxxxxx]
          4]=[101,111,1110,000,010] DataMem[
                                                    2]=[
                                                                  2] C-R-Sw-Dsp[1,0,1,xxxxxxxx]
Instr[
                                                            0,
Instr
          4]=[101,111,1110,000,010] DataMem[
                                                    2]=[
                                                                  2] C-R-Sw-Dsp[0,0,1,xxxxxxxx]
                                                            0,
          6]=[110,000,0101,100,100] DataMem[
                                                   10]=[
                                                                  x] C-R-Sw-Dsp[1,0,1,xxxxxxxx]
Instr[
                                                            0,
          6]=[110,000,0101,100,100] DataMem[
                                                   10]=[
                                                                  x] C-R-Sw-Dsp[0,0,1,xxxxxxx]
Instr[
                                                            0,
Instr[
          8]=[110,111,1111,010,010] DataMem[
                                                   1]=[
                                                            0,
                                                                  0] C-R-Sw-Dsp[1,0,1,xxxxxxx]
Instr[
          8]=[110,111,1111,010,010] DataMem[
                                                   1]=[
                                                            0,
                                                                  0] C-R-Sw-Dsp[0,0,1,xxxxxxxx]
         10]=[101,111,1101,000,111] DataMem[
                                                    ]=[0
                                                                  0] C-R-Sw-Dsp[1,0,1,xxxxxxx]
Instr[
                                                            0,
         10]=[101,111,1101,000,111] DataMem[
Instr[
                                                    ]=[0
                                                            0,
                                                                  0] C-R-Sw-Dsp[0,0,1,xxxxxxx]
          4]=[101,111,1110,000,010] DataMem[
Instr[
                                                    1]=[
                                                            0,
                                                                  1] C-R-Sw-Dsp[1,0,1,xxxxxxx]
Instr[
          4]=[101,111,1110,000,010] DataMem[
                                                    1]=[
                                                                  1] C-R-Sw-Dsp[0,0,1,xxxxxxxx]
                                                            0,
          6]=[110,000,0101,100,100] DataMem[
Instr[
                                                   15]=[
                                                            0,
                                                                  x] C-R-Sw-Dsp[1,0,1,xxxxxxx]
Instr[
          6]=[110,000,0101,100,100] DataMem[
                                                   15]=[
                                                            0,
                                                                  x] C-R-Sw-Dsp[0,0,1,xxxxxxxx]
Instr[
          8]=[110,111,1111,010,010] DataMem[
                                                   0]=[
                                                            0,
                                                                  0] C-R-Sw-Dsp[1,0,1,xxxxxxx]
Instr[
          8]=[110,111,1111,010,010] DataMem[
                                                   0]=[
                                                                  0] C-R-Sw-Dsp[0,0,1,xxxxxxx]
                                                            0,
         10]=[101,111,1101,000,111] DataMem[
                                                    ]=[0
                                                                  0] C-R-Sw-Dsp[1,0,1,xxxxxxx]
Instr[
                                                            0,
         10]=[101,111,1101,000,111] DataMem[
Instr
                                                    ]=[0
                                                            0.
                                                                  0] C-R-Sw-Dsp[0,0,1,xxxxxxx]
          4]=[101,111,1110,000,010] DataMem[
                                                                  0] C-R-Sw-Dsp[1,0,1,xxxxxxxx]
Instr
                                                    ]=[0
                                                            0,
```

```
Instr[
          4]=[101,111,1110,000,010] DataMem[
                                                    ]=[0
                                                            0,
                                                                   0] C-R-Sw-Dsp[0,0,1,xxxxxxx]
Instr[
          0]=[110,000,0011,111,010] DataMem[
                                                    3]=[
                                                            0,
                                                                   x] C-R-Sw-Dsp[1,0,1,xxxxxxx]
Instr[
          0]=[110,000,0011,111,010] DataMem[
                                                    3]=[
                                                                   x] C-R-Sw-Dsp[0,0,1,xxxxxxx]
                                                            0,
          2]=[000,111,0000,111,100] DataMem[
                                                    ]=[0
Instr[
                                                                   0] C-R-Sw-Dsp[1,0,1,xxxxxxx]
                                                            0,
Instr[
          2]=[000,111,0000,111,100] DataMem[
                                                    0]=[
                                                            0,
                                                                   0] C-R-Sw-Dsp[0,0,1,xxxxxxxx]
          4]=[101,111,1110,000,010] DataMem[
                                                    3]=[
                                                                   3] C-R-Sw-Dsp[1,0,1,xxxxxxx]
Instr[
                                                            0,
          4]=[101,111,1110,000,010] DataMem[
Instr[
                                                    3]=[
                                                            0,
                                                                   3] C-R-Sw-Dsp[0,0,1,xxxxxxx]
          6]=[110,000,0101,100,100] DataMem[
                                                    5]=[
                                                                   x] C-R-Sw-Dsp[1,0,1,xxxxxxx]
Instr[
                                                            0,
          6]=[110,000,0101,100,100] DataMem[
Instr[
                                                    5]=[
                                                                   x] C-R-Sw-Dsp[0,0,1,xxxxxxx]
                                                            0,
          8]=[110,111,1111,010,010] DataMem[
Instr
                                                    2]=[
                                                            0,
                                                                   0] C-R-Sw-Dsp[1,0,1,xxxxxxx]
          8]=[110,111,1111,010,010] DataMem[
Instr[
                                                    2]=[
                                                            0,
                                                                   0] C-R-Sw-Dsp[0,0,1,xxxxxxx]
Instr[
         10]=[101,111,1101,000,111] DataMem[
                                                    ]=[0
                                                            0,
                                                                   0] C-R-Sw-Dsp[1,0,1,xxxxxxx]
         10]=[101,111,1101,000,111] DataMem[
Instr[
                                                    ]=[0
                                                            0,
                                                                   0] C-R-Sw-Dsp[0,0,1,xxxxxxx]
Instr[
          4]=[101,111,1110,000,010] DataMem[
                                                    2]=[
                                                            0,
                                                                   2] C-R-Sw-Dsp[1,0,1,xxxxxxx]
          4]=[101,111,1110,000,010] DataMem[
Instr[
                                                    2]=[
                                                                   2] C-R-Sw-Dsp[0,0,1,xxxxxxxx]
                                                            0,
          6]=[110,000,0101,100,100] DataMem[
                                                                   x] C-R-Sw-Dsp[1,0,1,xxxxxxxx]
Instr
                                                   10]=[
                                                            0.
Instr[
          6]=[110,000,0101,100,100] DataMem[
                                                   10]=[
                                                                   x] C-R-Sw-Dsp[0,0,1,xxxxxxxx]
                                                            0,
          8]=[110,111,1111,010,010] DataMem[
Instr[
                                                    1]=[
                                                            0,
                                                                   0] C-R-Sw-Dsp[1,0,1,xxxxxxx]
          8]=[110,111,1111,010,010] DataMem[
                                                    1]=[
                                                                   0] C-R-Sw-Dsp[0,0,1,xxxxxxx]
Instr[
                                                            0,
Instr[
         10]=[101,111,1101,000,111] DataMem[
                                                    ]=[0
                                                            0.
                                                                   0] C-R-Sw-Dsp[1,0,1,xxxxxxx]
         10]=[101,111,1101,000,111] DataMem[
Instr
                                                    ]=[0
                                                            0.
                                                                   0] C-R-Sw-Dsp[0,0,1,xxxxxxxx]
Instr[
          4]=[101,111,1110,000,010] DataMem[
                                                    1]=[
                                                                   1] C-R-Sw-Dsp[1,0,1,xxxxxxxx]
                                                            0,
Instr[
          4]=[101,111,1110,000,010] DataMem[
                                                    1]=[
                                                                   1] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
                                                            0,
Instr[
          6]=[110,000,0101,100,100] DataMem[
                                                   15]=[
                                                            0,
                                                                   x] C-R-Sw-Dsp[1,0,0,xxxxxxxx]
          6]=[110,000,0101,100,100] DataMem[
                                                   15]=[
                                                                   x] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
Instr[
                                                            0,
Instr[
          8]=[110,111,1111,010,010] DataMem[
                                                    ]=[0
                                                                   0] C-R-Sw-Dsp[1,0,0,xxxxxxxx]
                                                            0,
                                                                   0] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
          8]=[110,111,1111,010,010] DataMem[
                                                    ]=[0
Instr[
                                                            0,
         10]=[101,111,1101,000,111] DataMem[
                                                    ]=[0
                                                                   0] C-R-Sw-Dsp[1,0,0,xxxxxxxx]
Instr[
                                                            0,
Instr[
         10]=[101,111,1101,000,111] DataMem[
                                                    ]=[0
                                                             0,
                                                                   0] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
Instr[
          4]=[101,111,1110,000,010] DataMem[
                                                    ]=[0
                                                            0,
                                                                   0] C-R-Sw-Dsp[1,0,0,xxxxxxxx]
Instr[
          4]=[101,111,1110,000,010] DataMem[
                                                    ]=[0
                                                                   0] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
                                                            0,
          0]=[110,000,0011,111,010] DataMem[
                                                                   x] C-R-Sw-Dsp[1,0,0,xxxxxxxx]
Instr[
                                                    3]=[
                                                            0,
          0]=[110,000,0011,111,010] DataMem[
                                                    3]=[
                                                                   x] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
Instr[
                                                            0,
          2]=[000,111,0000,111,100] DataMem[
Instr[
                                                    ]=[0
                                                                   0] C-R-Sw-Dsp[1,0,0,xxxxxxxx]
                                                            0,
          2]=[000,111,0000,111,100] DataMem[
Instr[
                                                    ]=[0
                                                            0,
                                                                   0] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
Instr[
          4]=[101,111,1110,000,010] DataMem[
                                                    3]=[
                                                            0,
                                                                   3] C-R-Sw-Dsp[1,0,0,xxxxxxxx]
Instr[
          4]=[101,111,1110,000,010] DataMem[
                                                    3]=[
                                                            0,
                                                                   3] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
          6]=[110,000,0101,100,100] DataMem[
Instr[
                                                    5]=[
                                                                   x] C-R-Sw-Dsp[1,0,0,xxxxxxxx]
                                                            0,
Instr[
          6]=[110,000,0101,100,100] DataMem[
                                                    5]=[
                                                                   x] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
                                                            0,
                                                                   0] C-R-Sw-Dsp[1,0,0,xxxxxxxx]
          8]=[110,111,1111,010,010] DataMem[
Instr
                                                    2]=[
                                                            0,
          8]=[110,111,1111,010,010] DataMem[
                                                    2]=[
                                                                   0] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
Instr[
                                                            0,
```

Instr[	10]=[101,111,1101,000,111] DataMem[	0]=[	0,	0] C-R-Sw-Dsp[1,0,0,xxxxxxx]
Instr[	10]=[101,111,1101,000,111] DataMem[	0]=[	0,	0] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
Instr[	4]=[101,111,1110,000,010] DataMem[	2]=[	0,	2] C-R-Sw-Dsp[1,0,0,xxxxxxxx]
Instr[	4]=[101,111,1110,000,010] DataMem[	2]=[	0,	2] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
Instr[	6]=[110,000,0101,100,100] DataMem[	10]=[	0,	x] C-R-Sw-Dsp[1,0,0,xxxxxxxx]
Instr[	6]=[110,000,0101,100,100] DataMem[	10]=[	0,	x] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
Instr[	8]=[110,111,1111,010,010]	1]=[	0,	0] C-R-Sw-Dsp[1,0,0,xxxxxxxx]
Instr[	8]=[110,111,1111,010,010] DataMem[	1]=[	0,	0] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
Instr[	10]=[101,111,1101,000,111]	0]=[	0,	0] C-R-Sw-Dsp[1,0,0,xxxxxxxx]
Instr[	10]=[101,111,1101,000,111] DataMem[	0]=[	0,	0] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
Instr[	4]=[101,111,1110,000,010] DataMem[	1]=[	0,	1] C-R-Sw-Dsp[1,0,0,xxxxxxxx]
Instr[	4]=[101,111,1110,000,010] DataMem[	1]=[	0,	1] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
Instr[	6]=[110,000,0101,100,100] DataMem[	15]=[	0,	x] C-R-Sw-Dsp[1,0,0,xxxxxxxx]
Instr[	6]=[110,000,0101,100,100] DataMem[	15]=[	0,	x] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
Instr[	8]=[110,111,1111,010,010]	0]=[	0,	0] C-R-Sw-Dsp[1,0,0,xxxxxxxx]
Instr[	8]=[110,111,1111,010,010]	0]=[	0,	0] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
Instr[	10]=[101,111,1101,000,111]	0]=[	0,	0] C-R-Sw-Dsp[1,0,0,xxxxxxxx]
Instr[	10]=[101,111,1101,000,111]	0]=[	0,	0] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
Instr[	4]=[101,111,1110,000,010] DataMem[	0]=[	0,	0] C-R-Sw-Dsp[1,0,0,xxxxxxxx]
Instr[	4]=[101,111,1110,000,010] DataMem[	0]=[	0,	0] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
Instr[	0]=[110,000,0011,111,010] DataMem[	3]=[	0,	x] C-R-Sw-Dsp[1,0,0,xxxxxxxx]
Instr[	0]=[110,000,0011,111,010]	3]=[	0,	x] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
Instr[	2]=[000,111,0000,111,100] DataMem[	0]=[	0,	0] C-R-Sw-Dsp[1,0,0,xxxxxxxx]
Instr[	2]=[000,111,0000,111,100] DataMem[	0]=[	0,	0] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
Instr[	4]=[101,111,1110,000,010] DataMem[	3]=[	0,	3] C-R-Sw-Dsp[1,0,0,xxxxxxxx]
Instr[	4]=[101,111,1110,000,010] DataMem[	3]=[	0,	3] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
Instr[	6]=[110,000,0101,100,100]	5]=[	0,	x] C-R-Sw-Dsp[1,0,0,xxxxxxxx]
Instr[	6]=[110,000,0101,100,100] DataMem[	5]=[	0,	x] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
Instr[	8]=[110,111,1111,010,010]	2]=[	0,	0] C-R-Sw-Dsp[1,0,0,xxxxxxxx]
Instr[	8]=[110,111,1111,010,010]	2]=[	0,	0] C-R-Sw-Dsp[0,0,0,xxxxxxxx]
Instr[	10]=[101,111,1101,000,111] DataMem[	0]=[	0,	0] C-R-Sw-Dsp[1,0,0,xxxxxxxx]
Exiting Veriwell at time 104				

## Stage #3

Instruction[pc]=[opcode,reg,reg,reg,funct]

DataMemory[addr]=[read data, write data]

Signals C-R-Sw-Disp[clock,reset,switch0,display]

\* Recall data memory addr = ALU output

```
Instr[
         x = [000,000,0000,000,000] DataMem[xxxx]=[
                                                         0,
                                                                x] C-R-Sw0-Dsp[0,0,1,xxxxxxxx]
Instr[
         x = [000,000,0000,000,000] DataMem[xxxx]=[
                                                         0,
                                                                x] C-R-Sw0-Dsp[1,0,1,xxxxxxxx]
Instr[
         x = [000,000,0000,000,000] DataMem[xxxx]=[
                                                         0,
                                                                x] C-R-Sw0-Dsp[0,1,1,xxxxxxxx]
         0]=[110,111,0000,111,011] DataMem[fff0]=[
                                                         0,
                                                               0] C-R-Sw0-Dsp[1,1,1,xxxxxxxx]
Instr[
Instr[
         0]=[110,111,0000,111,011] DataMem[fff0]=[
                                                         0,
                                                               0] C-R-Sw0-Dsp[0,0,1,xxxxxxxx]
         2]=[011,000,0000,011,101] DataMem[fff0]=[
Instr[
                                                         1,
                                                               x] C-R-Sw0-Dsp[1,0,1,xxxxxxx]
         2]=[011,000,0000,011,101] DataMem[fff0]=[
                                                               x] C-R-Sw0-Dsp[0,0,1,xxxxxxx]
Instr[
                                                         1,
Instr[
         4]=[111,000,0001,101,101] DataMem[0001]=[
                                                          0,
                                                                1] C-R-Sw0-Dsp[1,0,1,xxxxxxx]
         4]=[111,000,0001,101,101] DataMem[0001]=[
                                                                1] C-R-Sw0-Dsp[0,0,1,xxxxxxx]
Instr[
                                                          0,
         6]=[101,000,0011,000,101] DataMem[0001]=[
                                                          0.
                                                                1] C-R-Sw0-Dsp[1,0,1,xxxxxxx]
Instr[
         6]=[101,000,0011,000,101] DataMem[0001]=[
Instr
                                                          0.
                                                                1] C-R-Sw0-Dsp[0,0,1,xxxxxxxx]
         8]=[110,011,0000,111,100] DataMem[0030]=[
                                                          0,65520] C-R-Sw0-Dsp[1,0,1,xxxxxxxx]
Instr[
Instr[
         8]=[110,011,0000,111,100] DataMem[0030]=[
                                                          0,65520] C-R-Sw0-Dsp[0,0,1,xxxxxxxx]
Instr[
         10]=[101,000,0010,000,111] DataMem[0000]=[
                                                          0,
                                                                0] C-R-Sw0-Dsp[1,0,1,xxxxxxx]
         10]=[101,000,0010,000,111] DataMem[0000]=[
                                                          0.
                                                                0] C-R-Sw0-Dsp[0,0,1,xxxxxxxx]
Instr[
         14]=[100,000,1010,011,100] DataMem[fffa]=[
Instr[
                                                         0,
                                                              48] C-R-Sw0-Dsp[1,0,1,xxxxxxxx]
         14]=[100,000,1010,011,100] DataMem[fffa]=[
                                                         0,
                                                              48] C-R-Sw0-Dsp[0,0,1,xxxxxxx]
Instr[
                                                          0,
         16]=[101,111,1000,000,111] DataMem[0000]=[
                                                                0] C-R-Sw0-Dsp[1,0,1,0110000]
Instr[
Instr[
         16]=[101,111,1000,000,111] DataMem[0000]=[
                                                          0.
                                                                0] C-R-Sw0-Dsp[0,0,1,0110000]
Instr[
         0]=[110,111,0000,111,011] DataMem[fff0]=[
                                                         0,
                                                               0] C-R-Sw0-Dsp[1,0,1,0110000]
         0]=[110,111,0000,111,011] DataMem[fff0]=[
                                                         0,
                                                               0] C-R-Sw0-Dsp[0,0,1,0110000]
Instr[
         2]=[011,000,0000,011,101] DataMem[fff0]=[
                                                               x] C-R-Sw0-Dsp[1,0,1,0110000]
Instr[
                                                         1,
         2]=[011,000,0000,011,101] DataMem[fff0]=[
                                                               x] C-R-Sw0-Dsp[0,0,1,0110000]
Instr[
                                                         1,
Instr[
         4]=[111,000,0001,101,101] DataMem[0001]=[
                                                          0.
                                                                1] C-R-Sw0-Dsp[1,0,1,0110000]
         4]=[111,000,0001,101,101] DataMem[0001]=[
Instr[
                                                          0,
                                                                1] C-R-Sw0-Dsp[0,0,1,0110000]
Instr[
         6]=[101,000,0011,000,101] DataMem[0001]=[
                                                          0,
                                                                1] C-R-Sw0-Dsp[1,0,1,0110000]
Instr[
         6]=[101,000,0011,000,101] DataMem[0001]=[
                                                                1] C-R-Sw0-Dsp[0,0,1,0110000]
                                                          0,
         8]=[110,011,0000,111,100] DataMem[0030]=[
Instr[
                                                          0,65520] C-R-Sw0-Dsp[1,0,1,0110000]
         8]=[110,011,0000,111,100] DataMem[0030]=[
                                                          0,65520] C-R-Sw0-Dsp[0,0,1,0110000]
Instr[
         10]=[101,000,0010,000,111] DataMem[0000]=[
Instr
                                                                0] C-R-Sw0-Dsp[1,0,1,0110000]
                                                          0,
        10]=[101,000,0010,000,111] DataMem[0000]=[
                                                                0] C-R-Sw0-Dsp[0,0,1,0110000]
Instr[
                                                          0,
```

```
14]=[100,000,1010,011,100] DataMem[fffa]=[
                                                        0,
                                                             48] C-R-Sw0-Dsp[1,0,1,0110000]
Instr[
Instr[
        14]=[100,000,1010,011,100] DataMem[fffa]=[
                                                        0,
                                                             48] C-R-Sw0-Dsp[0,0,1,0110000]
Instr[
        16]=[101,111,1000,000,111] DataMem[0000]=[
                                                          0,
                                                                0] C-R-Sw0-Dsp[1,0,1,0110000]
         16]=[101,111,1000,000,111] DataMem[0000]=[
                                                          0.
                                                                0] C-R-Sw0-Dsp[0,0,1,0110000]
Instr[
Instr[
         0]=[110,111,0000,111,011] DataMem[fff0]=[
                                                        0,
                                                              0] C-R-Sw0-Dsp[1,0,1,0110000]
         0]=[110,111,0000,111,011] DataMem[fff0]=[
                                                        0,
                                                              0] C-R-Sw0-Dsp[0,0,1,0110000]
Instr[
         2]=[011,000,0000,011,101] DataMem[fff0]=[
                                                        1,
                                                              x] C-R-Sw0-Dsp[1,0,1,0110000]
Instr[
         2]=[011,000,0000,011,101] DataMem[fff0]=[
                                                        1,
                                                              x] C-R-Sw0-Dsp[0,0,1,0110000]
Instr[
         4]=[111,000,0001,101,101] DataMem[0001]=[
Instr[
                                                          0,
                                                                1] C-R-Sw0-Dsp[1,0,1,0110000]
         4]=[111,000,0001,101,101] DataMem[0001]=[
                                                                1] C-R-Sw0-Dsp[0,0,1,0110000]
Instr
                                                          0,
                                                                1] C-R-Sw0-Dsp[1,0,1,0110000]
Instr[
         6]=[101,000,0011,000,101] DataMem[0001]=[
                                                          0,
Instr[
         6]=[101,000,0011,000,101] DataMem[0001]=[
                                                          0,
                                                                1] C-R-Sw0-Dsp[0,0,1,0110000]
         8]=[110,011,0000,111,100] DataMem[0030]=[
Instr[
                                                          0,65520] C-R-Sw0-Dsp[1,0,1,0110000]
Instr[
         8]=[110,011,0000,111,100] DataMem[0030]=[
                                                          0,65520] C-R-Sw0-Dsp[0,0,1,0110000]
        10]=[101,000,0010,000,111] DataMem[0000]=[
Instr[
                                                          0,
                                                                0] C-R-Sw0-Dsp[1,0,1,0110000]
        10]=[101,000,0010,000,111] DataMem[0000]=[
                                                          0.
                                                                0] C-R-Sw0-Dsp[0,0,1,0110000]
Instr[
Instr[
        14]=[100,000,1010,011,100] DataMem[fffa]=[
                                                        0,
                                                             48] C-R-Sw0-Dsp[1,0,1,0110000]
                                                             48] C-R-Sw0-Dsp[0,0,1,0110000]
Instr[
        14]=[100,000,1010,011,100] DataMem[fffa]=[
                                                        0,
Instr[
        16]=[101,111,1000,000,111] DataMem[0000]=[
                                                          0.
                                                                0] C-R-Sw0-Dsp[1,0,1,0110000]
        16]=[101,111,1000,000,111] DataMem[0000]=[
Instr[
                                                          0.
                                                                0] C-R-Sw0-Dsp[0,0,1,0110000]
         0]=[110,111,0000,111,011] DataMem[fff0]=[
                                                              0] C-R-Sw0-Dsp[1,0,1,0110000]
Instr
                                                        0,
Instr[
         0]=[110,111,0000,111,011] DataMem[fff0]=[
                                                        0,
                                                              0] C-R-Sw0-Dsp[0,0,1,0110000]
Instr[
         2]=[011,000,0000,011,101] DataMem[fff0]=[
                                                        1,
                                                              x] C-R-Sw0-Dsp[1,0,1,0110000]
Instr[
         2]=[011,000,0000,011,101] DataMem[fff0]=[
                                                        0,
                                                              x] C-R-Sw0-Dsp[0,0,0,0110000]
Instr[
         4]=[111,000,0001,101,101] DataMem[0000]=[
                                                          0,
                                                                0] C-R-Sw0-Dsp[1,0,0,0110000]
         4]=[111,000,0001,101,101] DataMem[0000]=[
Instr[
                                                          0,
                                                                0] C-R-Sw0-Dsp[0,0,0,0110000]
         6]=[101,000,0011,000,101] DataMem[0000]=[
                                                          0,
                                                                0] C-R-Sw0-Dsp[1,0,0,0110000]
Instr[
                                                          0.
Instr[
         6]=[101,000,0011,000,101] DataMem[0000]=[
                                                                0] C-R-Sw0-Dsp[0,0,0,0110000]
Instr[
         12]=[110,111,1110,111,100] DataMem[fffe]=[
                                                        0,
                                                              0] C-R-Sw0-Dsp[1,0,0,0110000]
Instr[
        12]=[110,111,1110,111,100] DataMem[fffe]=[
                                                        0,
                                                              0] C-R-Sw0-Dsp[0,0,0,0110000]
Instr[
        14]=[100,000,1010,011,100] DataMem[fffa]=[
                                                        0,65534] C-R-Sw0-Dsp[1,0,0,0110000]
        14]=[100,000,1010,011,100] DataMem[fffa]=[
                                                        0,65534] C-R-Sw0-Dsp[0,0,0,0110000]
Instr[
         16]=[101,111,1000,000,111] DataMem[0000]=[
                                                          0,
                                                                0] C-R-Sw0-Dsp[1,0,0,1111110]
Instr[
         16]=[101,111,1000,000,111] DataMem[0000]=[
                                                          0.
Instr[
                                                                0] C-R-Sw0-Dsp[0,0,0,1111110]
         0]=[110,111,0000,111,011] DataMem[fff0]=[
                                                              0] C-R-Sw0-Dsp[1,0,0,1111110]
Instr[
                                                        0,
Instr[
         0]=[110,111,0000,111,011] DataMem[fff0]=[
                                                        0,
                                                              0] C-R-Sw0-Dsp[0,0,0,1111110]
         2]=[011,000,0000,011,101] DataMem[fff0]=[
Instr[
                                                        0,
                                                              x] C-R-Sw0-Dsp[1,0,0,1111110]
         2]=[011,000,0000,011,101] DataMem[fff0]=[
Instr[
                                                        0,
                                                              x] C-R-Sw0-Dsp[0,0,0,1111110]
         4]=[111,000,0001,101,101] DataMem[0000]=[
Instr[
                                                          0.
                                                                0] C-R-Sw0-Dsp[1,0,0,1111110]
         4]=[111,000,0001,101,101] DataMem[0000]=[
                                                                0] C-R-Sw0-Dsp[0,0,0,1111110]
Instr[
                                                          0,
         6]=[101,000,0011,000,101] DataMem[0000]=[
                                                                0] C-R-Sw0-Dsp[1,0,0,1111110]
Instr[
                                                          0,
```

```
Instr[
         6]=[101,000,0011,000,101] DataMem[0000]=[
                                                          0.
                                                                0] C-R-Sw0-Dsp[0,0,0,1111110]
Instr[
        12]=[110,111,1110,111,100] DataMem[fffe]=[
                                                        0,
                                                              0] C-R-Sw0-Dsp[1,0,0,1111110]
Instr[
        12]=[110,111,1110,111,100] DataMem[fffe]=[
                                                        0.
                                                              0] C-R-Sw0-Dsp[0,0,0,1111110]
         14]=[100,000,1010,011,100] DataMem[fffa]=[
                                                        0,65534] C-R-Sw0-Dsp[1,0,0,1111110]
Instr[
Instr[
        14]=[100,000,1010,011,100] DataMem[fffa]=[
                                                        0,65534] C-R-Sw0-Dsp[0,0,0,1111110]
Instr[
         16]=[101,111,1000,000,111] DataMem[0000]=[
                                                          0,
                                                                0] C-R-Sw0-Dsp[1,0,0,1111110]
        16]=[101,111,1000,000,111] DataMem[0000]=[
                                                          0.
                                                                0] C-R-Sw0-Dsp[0,0,0,1111110]
Instr[
                                                        0,
         0]=[110,111,0000,111,011] DataMem[fff0]=[
                                                              0] C-R-Sw0-Dsp[1,0,0,1111110]
Instr[
         0]=[110,111,0000,111,011] DataMem[fff0]=[
Instr[
                                                        0,
                                                              0] C-R-Sw0-Dsp[0,0,0,1111110]
         2]=[011,000,0000,011,101] DataMem[fff0]=[
                                                              x] C-R-Sw0-Dsp[1,0,0,1111110]
Instr
                                                        0.
Instr[
         2]=[011,000,0000,011,101] DataMem[fff0]=[
                                                        0,
                                                              x] C-R-Sw0-Dsp[0,0,0,1111110]
Instr[
         4]=[111,000,0001,101,101] DataMem[0000]=[
                                                          0,
                                                                0] C-R-Sw0-Dsp[1,0,0,1111110]
         4]=[111,000,0001,101,101] DataMem[0000]=[
Instr[
                                                          0,
                                                                0] C-R-Sw0-Dsp[0,0,0,1111110]
Instr[
         6]=[101,000,0011,000,101] DataMem[0000]=[
                                                          0,
                                                                0] C-R-Sw0-Dsp[1,0,0,1111110]
         6]=[101,000,0011,000,101] DataMem[0000]=[
                                                          0,
                                                                0] C-R-Sw0-Dsp[0,0,0,1111110]
Instr[
        12]=[110,111,1110,111,100] DataMem[fffe]=[
                                                        0,
                                                              0] C-R-Sw0-Dsp[1,0,0,1111110]
Instr
Instr[
        12]=[110,111,1110,111,100] DataMem[fffe]=[
                                                              0] C-R-Sw0-Dsp[0,0,0,1111110]
                                                        0,
                                                        0,65534] C-R-Sw0-Dsp[1,0,0,11111110]
Instr[
        14]=[100,000,1010,011,100] DataMem[fffa]=[
Instr[
        14]=[100,000,1010,011,100] DataMem[fffa]=[
                                                        0,65534] C-R-Sw0-Dsp[0,0,0,1111110]
        16]=[101,111,1000,000,111] DataMem[0000]=[
Instr[
                                                          0.
                                                                0] C-R-Sw0-Dsp[1,0,0,1111110]
         16]=[101,111,1000,000,111] DataMem[0000]=[
                                                          0.
                                                                0] C-R-Sw0-Dsp[0,0,0,11111110]
Instr
Instr[
         0]=[110,111,0000,111,011] DataMem[fff0]=[
                                                        0,
                                                              0] C-R-Sw0-Dsp[1,0,0,1111110]
Instr[
         0]=[110,111,0000,111,011] DataMem[fff0]=[
                                                        0,
                                                              0] C-R-Sw0-Dsp[0,0,0,1111110]
Instr[
         2]=[011,000,0000,011,101] DataMem[fff0]=[
                                                        0,
                                                              x] C-R-Sw0-Dsp[1,0,0,1111110]
Instr[
         2]=[011,000,0000,011,101] DataMem[fff0]=[
                                                        0,
                                                              x] C-R-Sw0-Dsp[0,0,0,1111110]
         4]=[111,000,0001,101,101] DataMem[0000]=[
Instr[
                                                          0.
                                                                0] C-R-Sw0-Dsp[1,0,0,1111110]
         4]=[111,000,0001,101,101] DataMem[0000]=[
                                                          0,
                                                                0] C-R-Sw0-Dsp[0,0,0,1111110]
Instr[
         6]=[101,000,0011,000,101] DataMem[0000]=[
Instr[
                                                          0,
                                                                0] C-R-Sw0-Dsp[1,0,0,1111110]
Instr[
         6]=[101,000,0011,000,101] DataMem[0000]=[
                                                          0,
                                                                0] C-R-Sw0-Dsp[0,0,0,1111110]
Instr[
        12]=[110,111,1110,111,100] DataMem[fffe]=[
                                                        0,
                                                              0] C-R-Sw0-Dsp[1,0,0,1111110]
Instr[
        12]=[110,111,1110,111,100] DataMem[fffe]=[
                                                        0.
                                                              0] C-R-Sw0-Dsp[0,0,0,1111110]
        14]=[100,000,1010,011,100] DataMem[fffa]=[
                                                        0,65534] C-R-Sw0-Dsp[1,0,0,1111110]
Instr[
Exiting Veriwell at time 104
```