ADDER

a	b	carryin	carryout	carryout expected	sum	sum expected
0	0	0	0	0	0	0
0	0	1	0	0	1	1
0	1	0	0	0	1	1
0	1	1	1	1	0	0
1	0	0	0	0	1	1
1	0	1	1	1	0	0
1	1	0	1	1	0	0
1	1	1	1	1	1	1
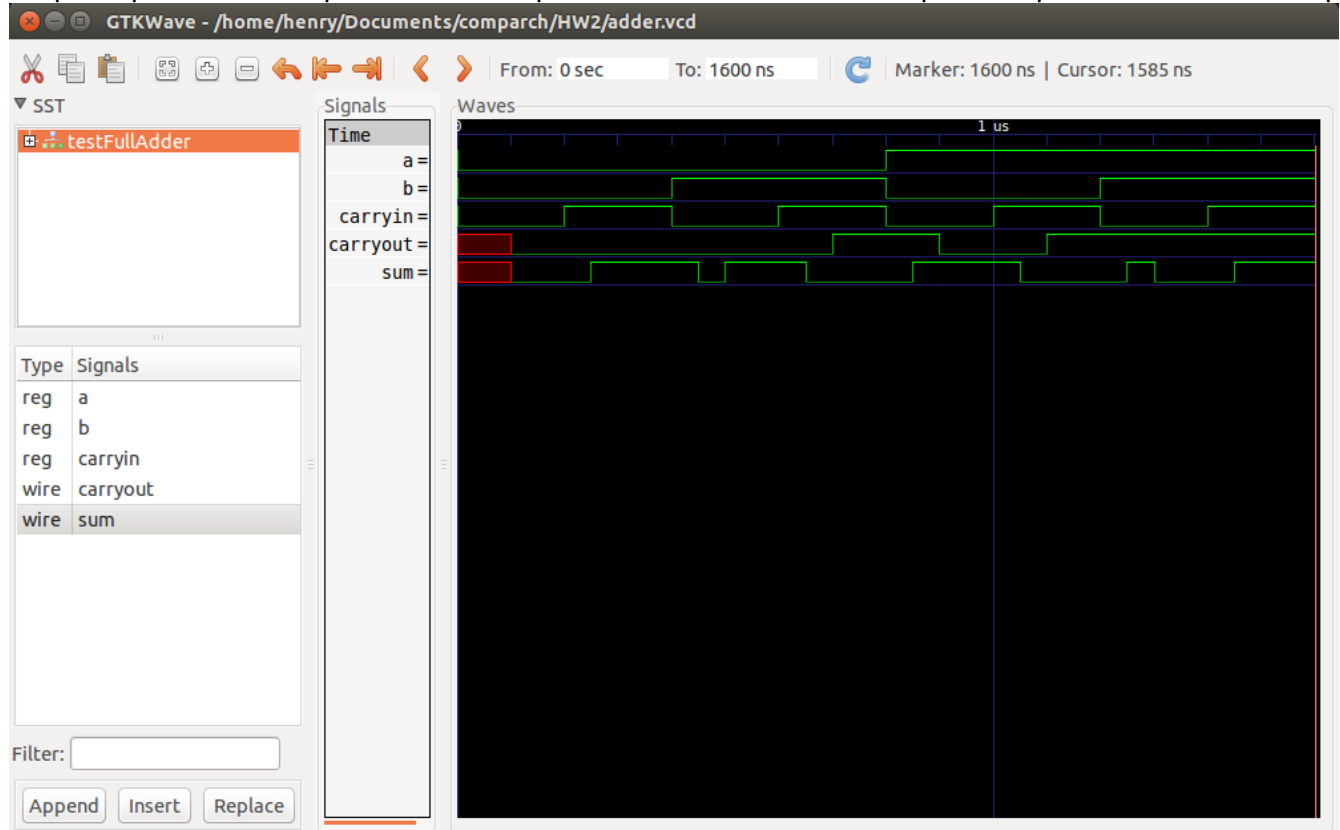
```
DECODER
En A0 A1|  O0 O1 O2 O3 |  Expected Output
0  0  0 |  0  0  0  0  |  All false
0  1  0 |  0  0  0  0  |  All false
0  0  1 |  0  0  0  0  |  All false
0  1  1 |  0  0  0  0  |  All false
1  0  0 |  1  0  0  0  |  O0 Only
1  1  0 |  0  1  0  0  |  O1 Only
1  0  1 |  0  0  1  0  |  O2 Only
1  1  1 |  0  0  0  1  |  O3 Only
```
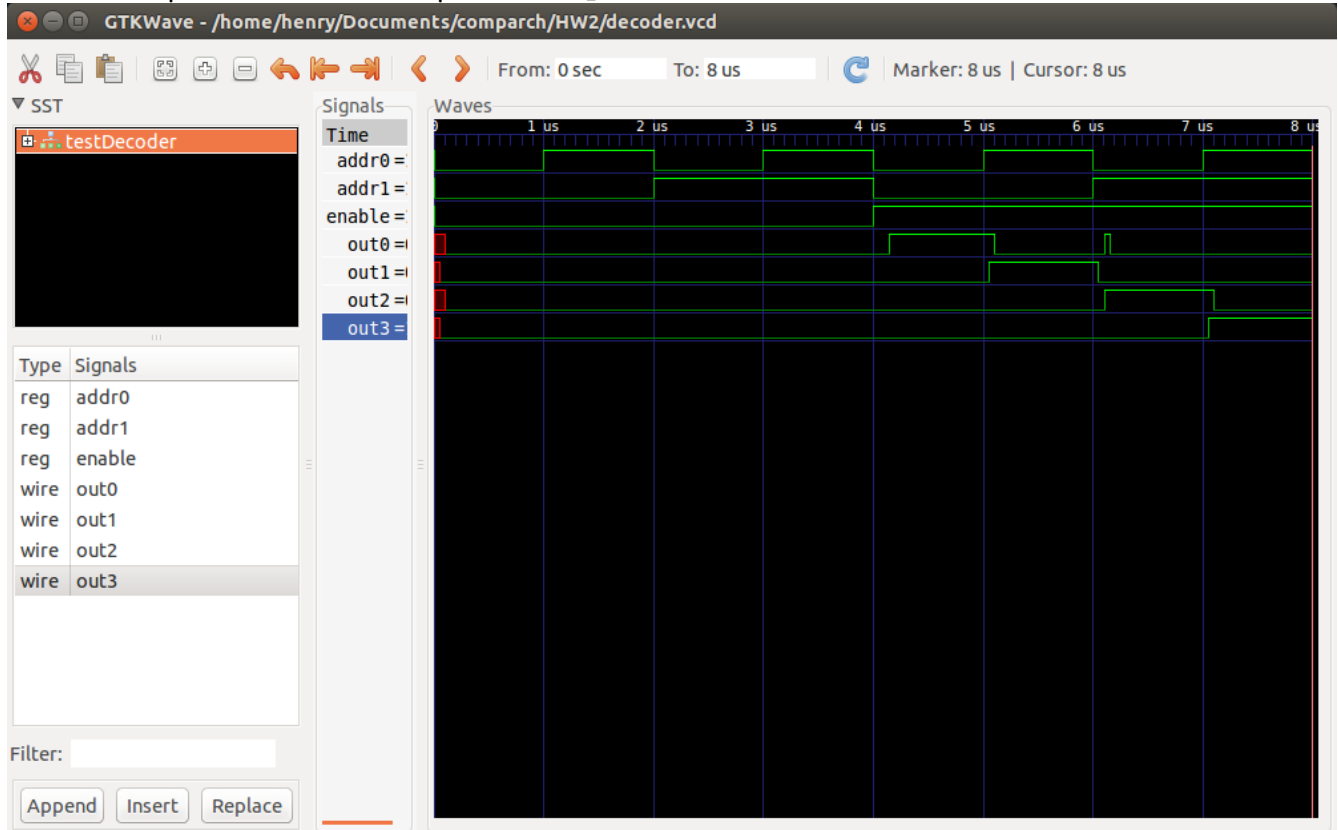
MULTIPLEXER

address0	address1	in0	in1	in2	in3	out	out expected
0	0	0	0	0	0	0	0
0	0	0	0	0	1	0	0
0	0	0	0	1	0	0	0
0	0	0	0	1	1	0	0
0	0	0	1	0	0	0	0
0	0	0	1	0	1	0	0
0	0	0	1	1	0	0	0
0	0	0	1	1	1	0	0
0	0	1	0	0	0	1	1
0	0	1	0	0	1	1	1
0	0	1	0	1	0	1	1
0	0	1	0	1	1	1	1
0	0	1	1	0	0	1	1
0	0	1	1	0	1	1	1
0	0	1	1	1	0	1	1
0	0	1	1	1	1	1	1
0	1	0	0	0	0	0	0
0	1	0	0	0	1	0	0
0	1	0	0	1	0	1	1
0	1	0	0	1	1	1	1
0	1	0	1	0	0	0	0
0	1	0	1	0	1	0	0
0	1	0	1	1	0	1	1
0	1	0	1	1	1	1	1
0	1	1	0	0	0	0	0
0	1	1	0	0	1	0	0
0	1	1	0	1	0	1	1
0	1	1	0	1	1	1	1
0	1	1	1	0	0	0	0
0	1	1	1	0	1	0	0
0	1	1	1	1	0	1	1
0	1	1	1	1	1	1	1
1	0	0	0	0	0	0	0
1	0	0	0	0	1	0	0
1	0	0	0	1	0	0	0
1	0	0	0	1	1	0	0
1	0	0	1	0	0	1	1
1	0	0	1	0	1	1	1
1	0	0	1	1	0	1	1
1	0	0	1	1	1	1	1
1	0	1	0	0	0	0	0
1	0	1	0	0	1	0	0
1	0	1	0	1	0	0	0
1	0	1	0	1	1	0	0
1	0	1	1	0	0	1	1

address0	address1	in0	in1	in2	in3	out	out expected
1	0	1	1	0	1	1	1
1	0	1	1	1	0	1	1
1	0	1	1	1	1	1	1
1	1	0	0	0	0	0	0
1	1	0	0	0	1	1	1
1	1	0	0	1	0	0	0
1	1	0	0	1	1	1	1
1	1	0	1	0	0	0	0
1	1	0	1	0	1	1	1
1	1	0	1	1	0	0	0
1	1	0	1	1	1	1	1
1	1	1	0	0	0	0	0
1	1	1	0	0	1	1	1
1	1	1	0	1	0	0	0
1	1	1	0	1	1	1	1
1	1	1	1	0	0	0	0
1	1	1	1	0	1	1	1
1	1	1	1	1	0	0	0
1	1	1	1	1	1	1	1