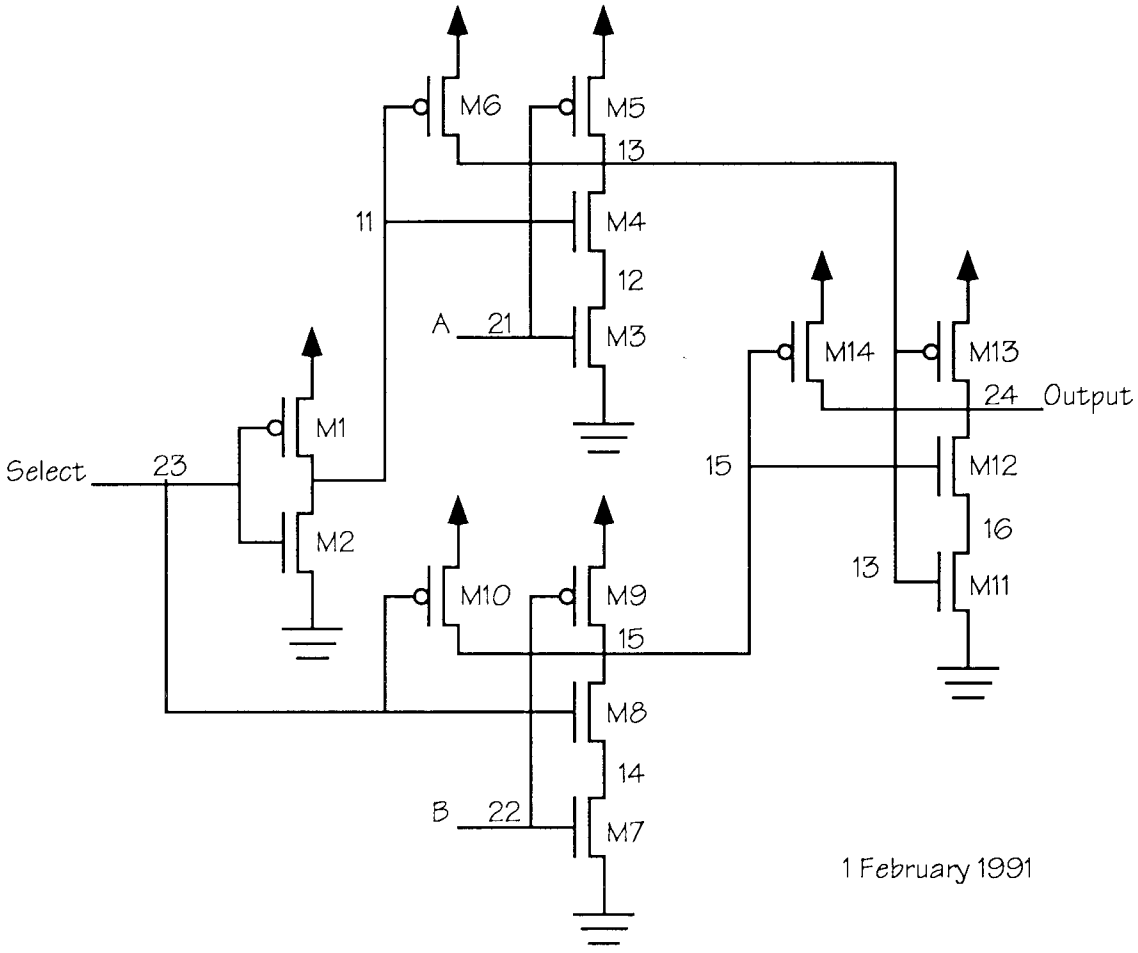
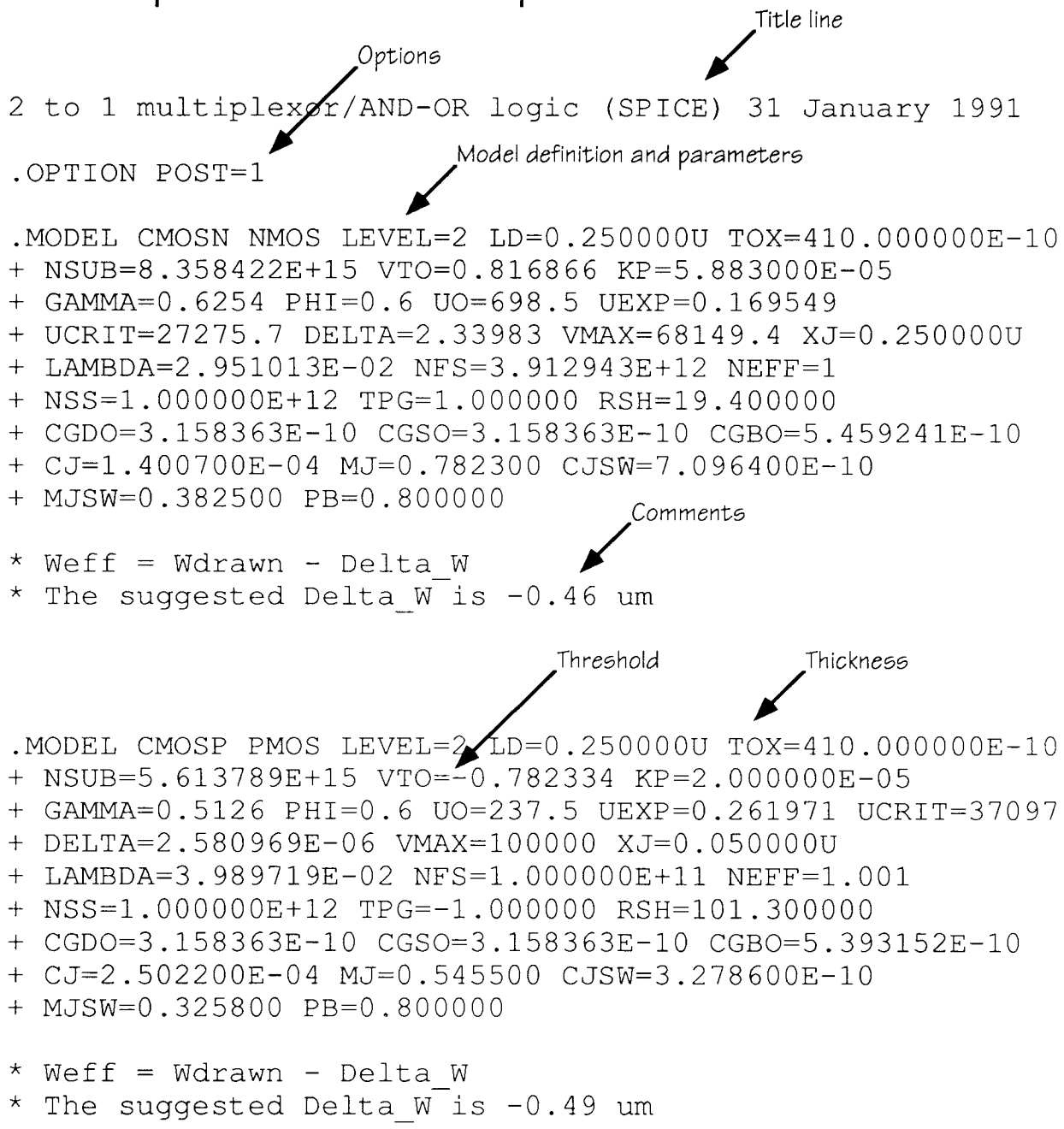
Two to one multiplexer

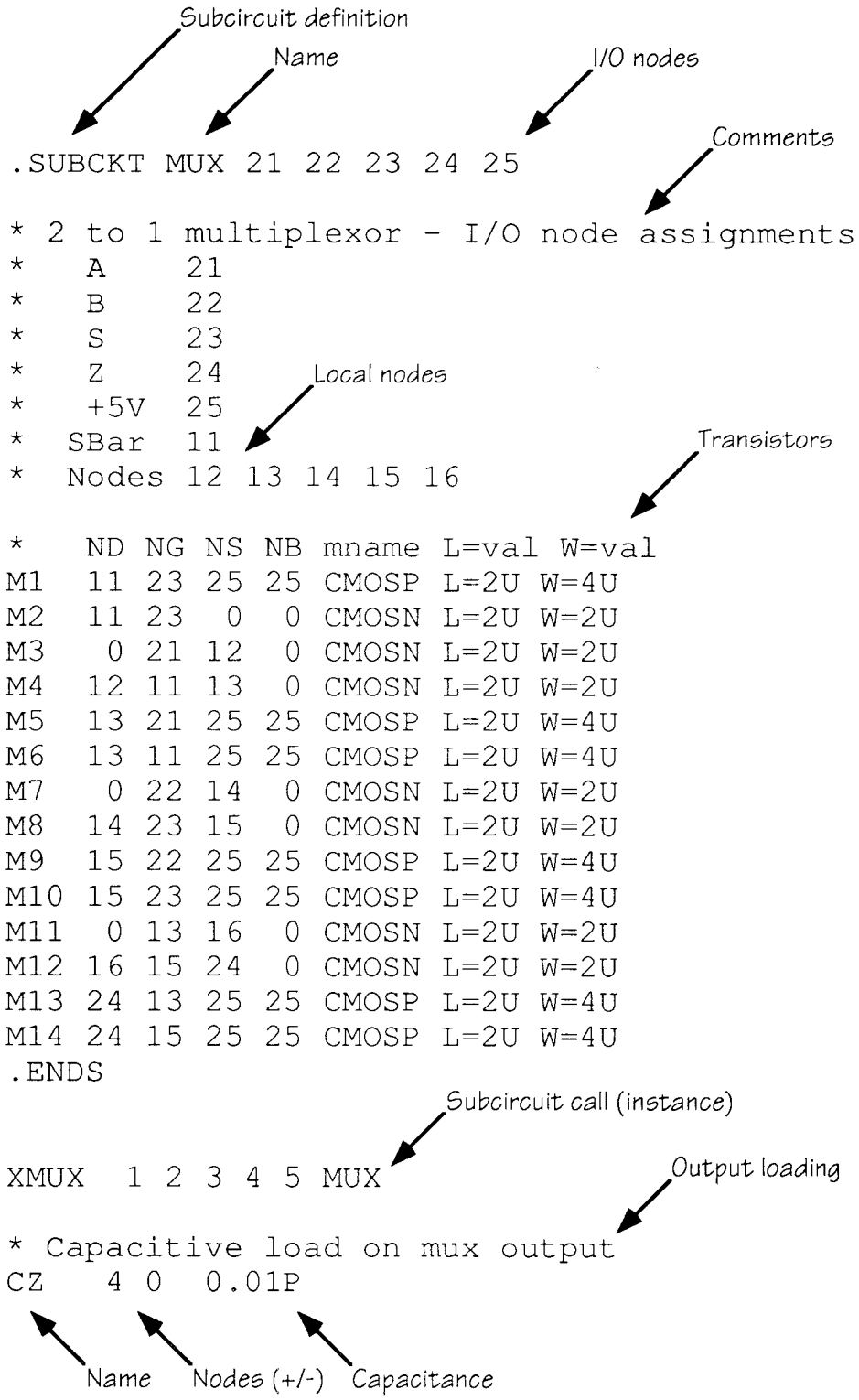


Spice example: Two to one multiplexer



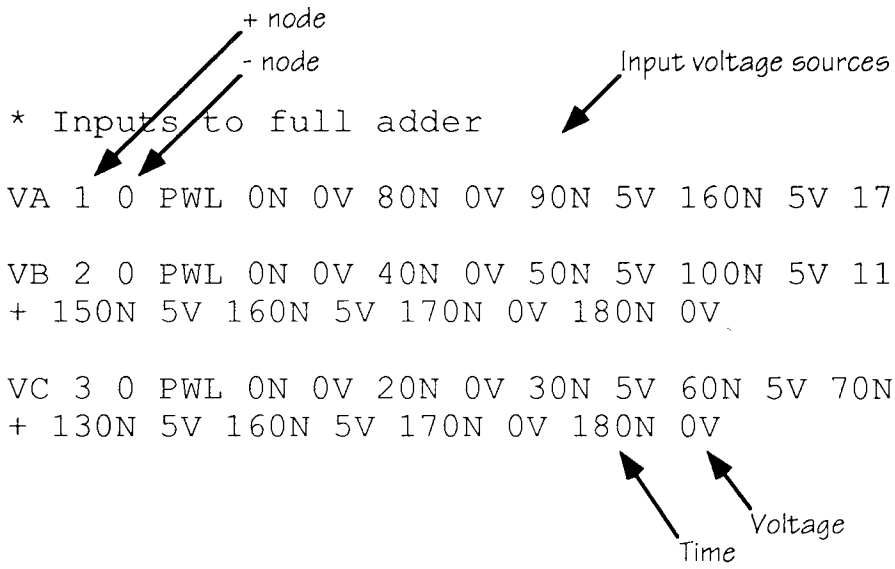

```
2 to 1 multiplexor/AND-OR logic (SPICE) 31 January 1991

.OPTION POST=1

.MODEL CMOSN NMOS LEVEL=2 LD=0.250000U TOX=410.000000E-10
+ NSUB=8.358422E+15 VTO=0.816866 KP=5.883000E-05
+ GAMMA=0.6254 PHI=0.6 UO=698.5 UEXP=0.169549
+ UCRIT=27275.7 DELTA=2.33983 VMAX=68149.4 XJ=0.250000U
+ LAMBDA=2.951013E-02 NFS=3.912943E+12 NEFF=1
+ NSS=1.000000E+12 TPG=1.000000 RSH=19.400000
+ CGDO=3.158363E-10 CGSO=3.158363E-10 CGBO=5.459241E-10
+ CJ=1.400700E-04 MJ=0.782300 CJSW=7.096400E-10
+ MJSW=0.382500 PB=0.800000

* Weff = Wdrawn - Delta_W
* The suggested Delta_W is -0.46 um

.MODEL CMOSP PMOS LEVEL=2 LD=0.250000U TOX=410.000000E-10
+ NSUB=5.613789E+15 VTO=-0.782334 KP=2.000000E-05
+ GAMMA=0.5126 PHI=0.6 UO=237.5 UEXP=0.261971 UCRIT=37097
+ DELTA=2.580969E-06 VMAX=100000 XJ=0.050000U
+ LAMBDA=3.989719E-02 NFS=1.000000E+11 NEFF=1.001
+ NSS=1.000000E+12 TPG=-1.000000 RSH=101.300000
+ CGDO=3.158363E-10 CGSO=3.158363E-10 CGBO=5.393152E-10
+ CJ=2.502200E-04 MJ=0.545500 CJSW=3.278600E-10
+ MJSW=0.325800 PB=0.800000

* Weff = Wdrawn - Delta_W
* The suggested Delta_W is -0.49 um
```

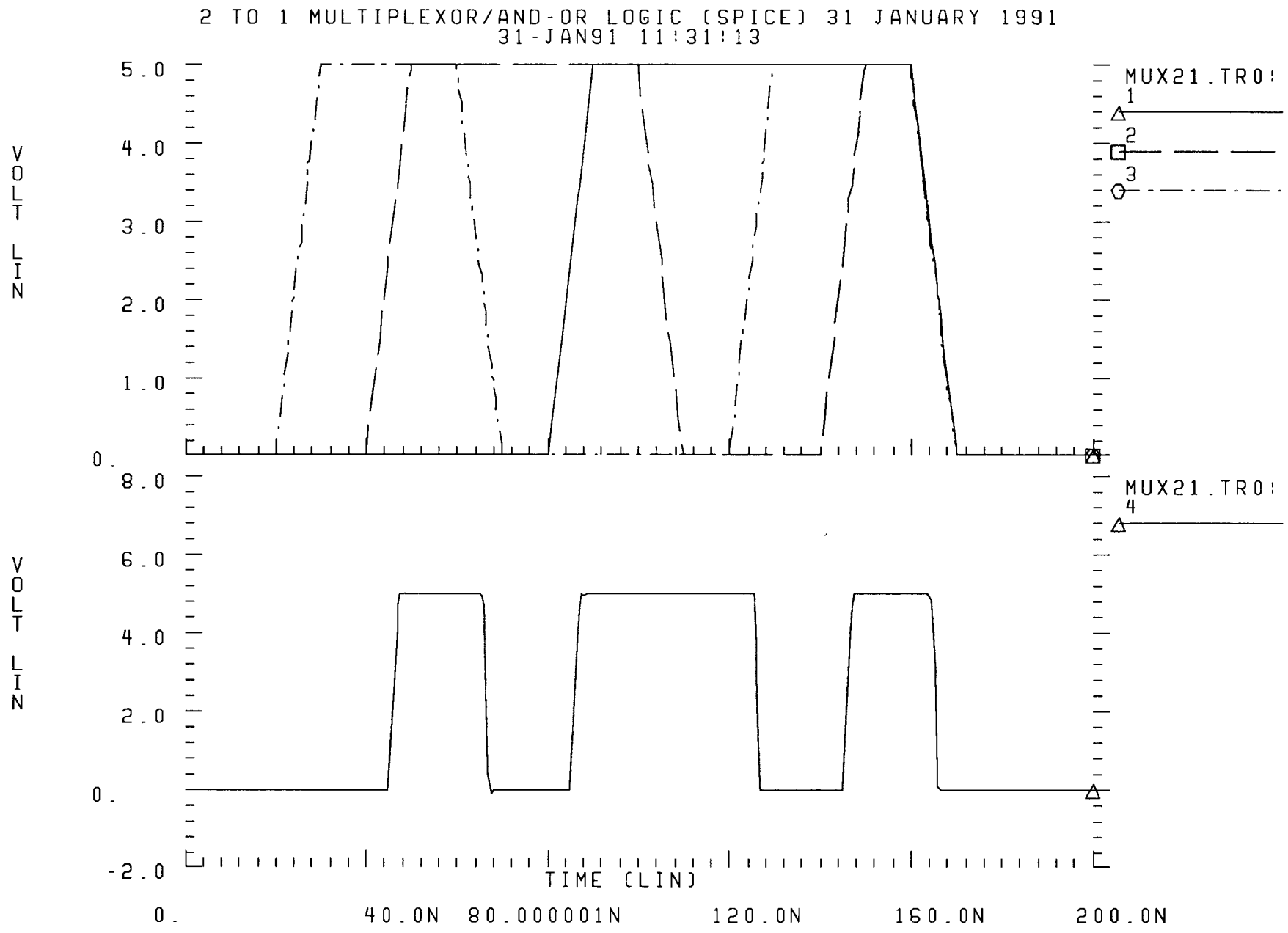
Two to one multiplexer (2)




```
.SUBCKT MUX 21 22 23 24 25

* 2 to 1 multiplexor - I/O node assignments
*   A     21
*   B     22
*   S     23
*   Z     24
*   +5V   25
*  SBar   11
*  Nodes 12 13 14 15 16

*    ND  NG  NS  NB  mname  L=val  W=val
M1   11  23  25  25  CMOSP  L=2U  W=4U
M2   11  23   0   0  CMOSN  L=2U  W=2U
M3    0  21  12   0  CMOSN  L=2U  W=2U
M4   12  11  13   0  CMOSN  L=2U  W=2U
M5   13  21  25  25  CMOSP  L=2U  W=4U
M6   13  11  25  25  CMOSP  L=2U  W=4U
M7    0  22  14   0  CMOSN  L=2U  W=2U
M8   14  23  15   0  CMOSN  L=2U  W=2U
M9   15  22  25  25  CMOSP  L=2U  W=4U
M10  15  23  25  25  CMOSP  L=2U  W=4U
M11   0  13  16   0  CMOSN  L=2U  W=2U
M12  16  15  24   0  CMOSN  L=2U  W=2U
M13  24  13  25  25  CMOSP  L=2U  W=4U
M14  24  15  25  25  CMOSP  L=2U  W=4U
.ENDS

XMUX   1  2  3  4  5  MUX

* Capacitive load on mux output
CZ    4  0   0.01P
```

Two to one multiplexer example (3)




2 TO 1 MULTIPLEXOR/AND-OR LOGIC (SPICE) 31 JANUARY 1991
31-JAN91 11:31:13
VOLT LIN
5.0
4.0
3.0
2.0
1.0
0.
MUX21.TR0!
1
2
3
VOLT LIN
8.0
6.0
4.0
2.0
0.
-2.0
MUX21.TR0!
4
TIME (LIN)
0.
40.0N
80.000001N
120.0N
160.0N
200.0N