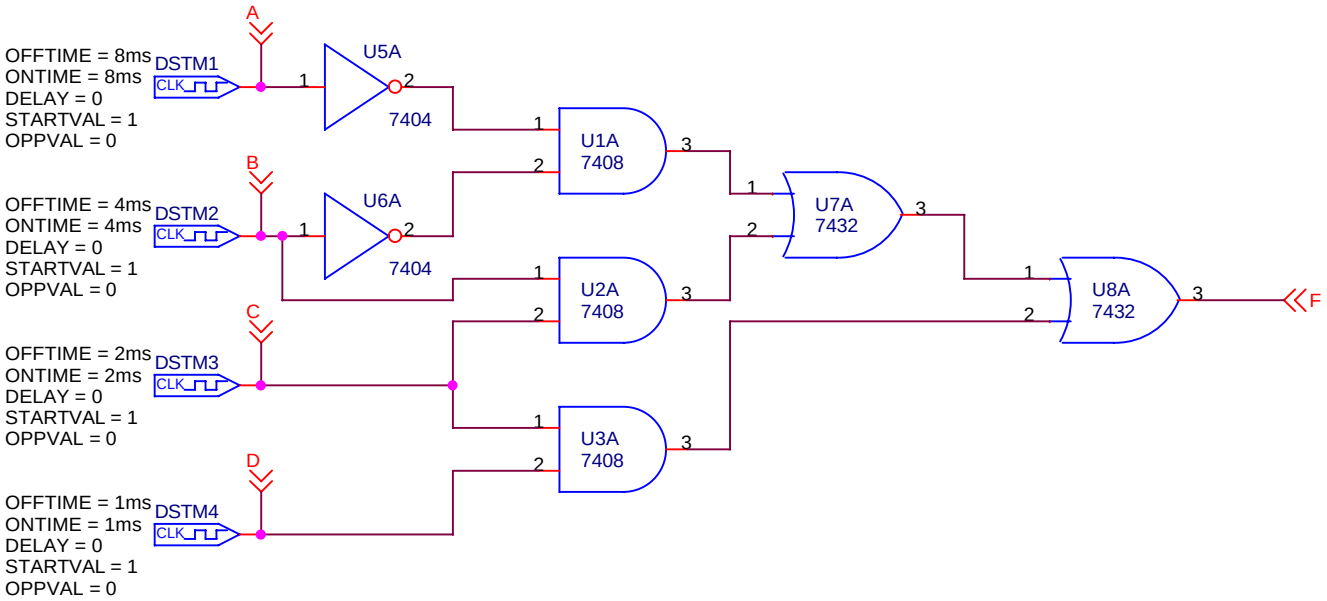
EGR 270
Fundamentals of Computer Engineering
File: Combinational Logic.opj

Combinational Logic Circuit

Purpose: Implement the function f(A,B,C,D) = Sum(0-3, 6-7, 11, 14-15) = A'B' + BC + CD using AND, OR, and NOT gates.

Analysis: In order to display the output for all 16 combinations of inputs, a TRANSIENT analysis will be performed. Since D is the LSB and has an ONTIME and OFFTIME of 1ms, the transient analysis should be performed for at least 16(1ms) = 16ms.



Notes:

1) The logic gates are found in the EVAL library.

2) Digital Clocks from the SOURCE library are used for the circuit inputs.

3) The frequency (or the ONTIME and OFFTIME) of the digital clocks is not important. The ONTIME and OFFTIME for D were chosen as 1ms, but could have just as easily been 1us or 5s.

4) OFFPAGE symbols (<<C on the toolbar) were used to conveniently label the inputs A, B, C, D and the output F. These labels can then be used when graphing the results.

5) The binary value of the input has been displayed on the graph by using a BUS (group of signals). To do this, analyze the circuit and on the graph select TRACE - ADD then enter {A,B,C,D};COUNT;D where

{A,B,C,D} represents the signals in the binary value with the MSB listed first

COUNT could be any name that will appear on the graph

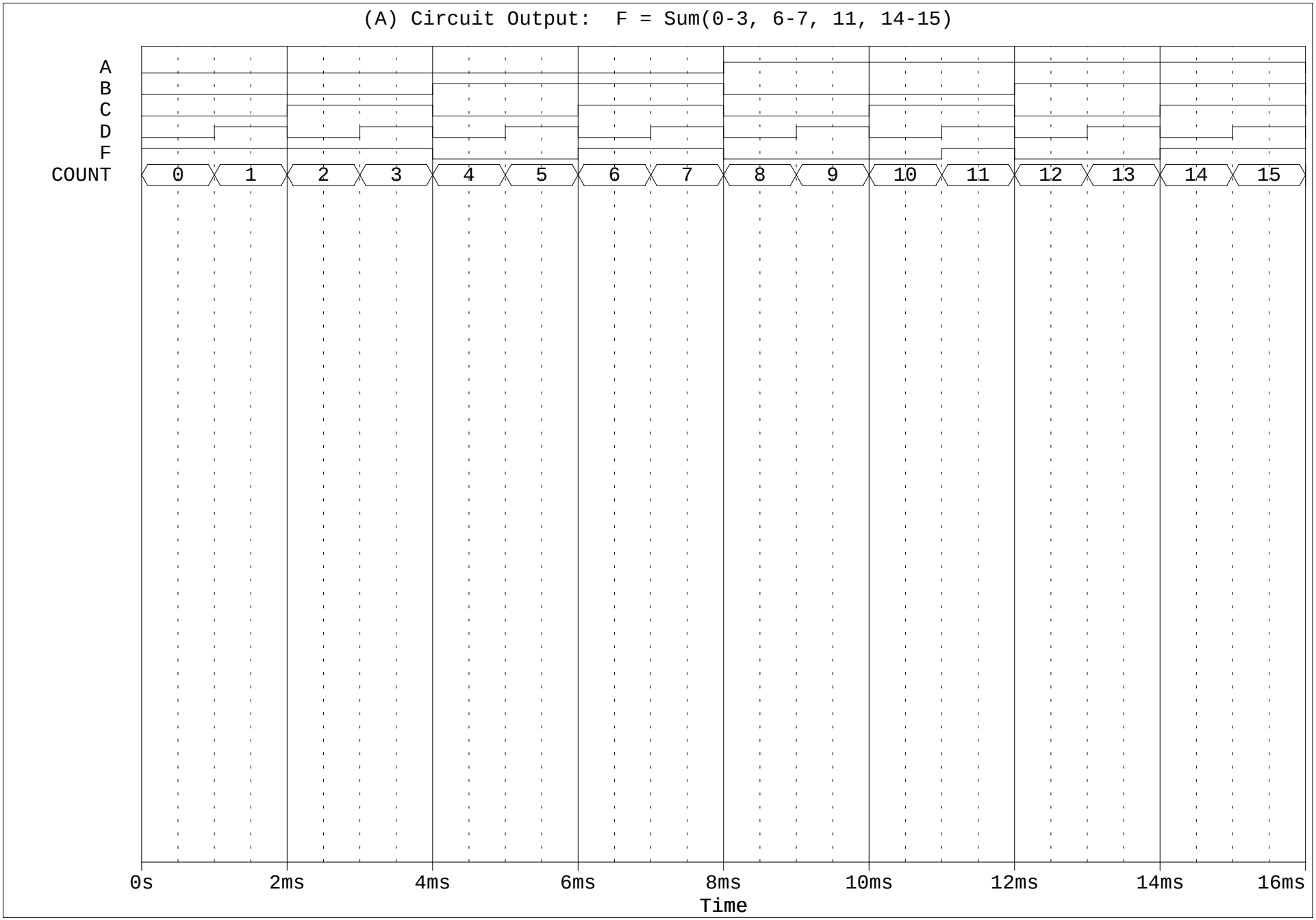
D means to show the count in decimal format

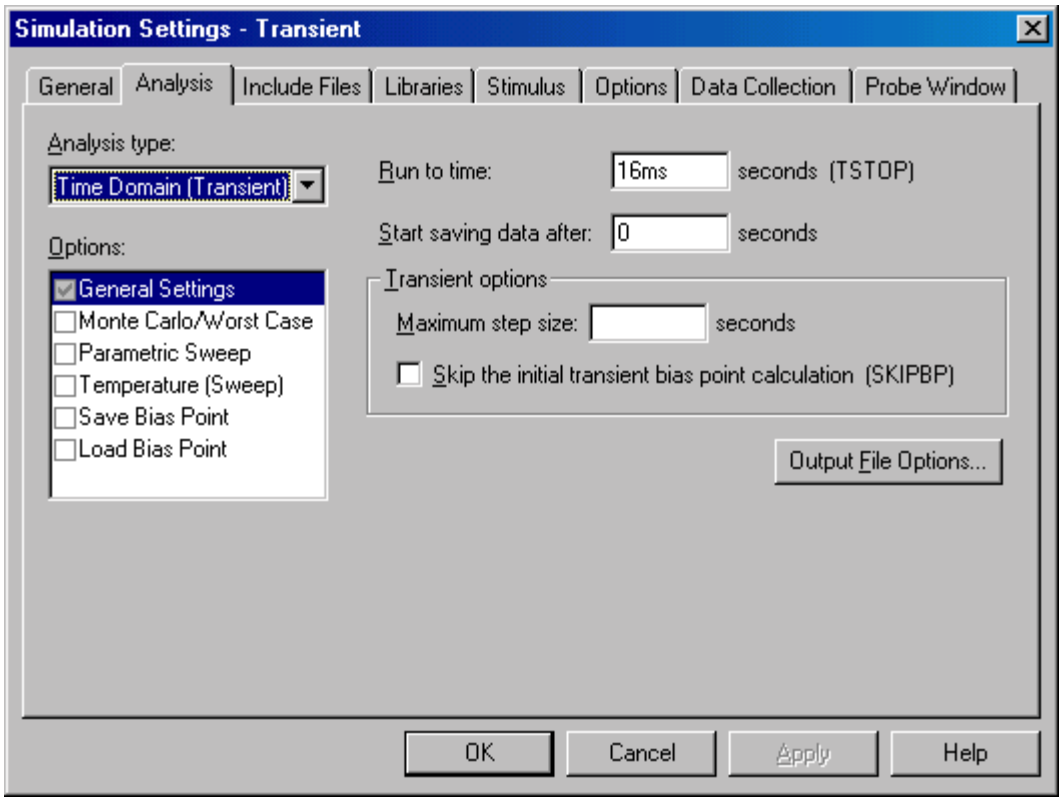
(use B for binary, O for octal, and H or X for hexadecimal)

Title <Title>		
Size A	Document Number <Doc>	Rev <RevCode>
Date: Monday, February 14	Sheet 1 of 1	

** circuit file for profile: Transient

Date/Time run: 02/14 21:29:25 Temperature: 27.0




Simulation Settings - Transient
General
Analysis
Include Files
Libraries
Stimulus
Options
Data Collection
Probe Window
Analysis type:
Time Domain (Transient)
Options:
General Settings
Monte Carlo/Worst Case
Parametric Sweep
Temperature (Sweep)
Save Bias Point
Load Bias Point
Run to time:
16ms
seconds (TSTOP)
Start saving data after:
0
seconds
Transient options
Maximum step size:
seconds
Skip the initial transient bias point calculation (SKIPBP)
Output File Options...
OK
Cancel
Apply
Help