

Title: SOLVING GATING PROBLEMS THE EASY WAY

Materials:

- [1] 7404 1-input inverter IC
- [1] 7420 4-input NAND gate IC
- [1] 7410 3-input NAND gate IC

Procedure:

1. Write the minterm Boolean expression for the truth table in Table 8b.
2. Label the rows and columns of the K-Map in Fig. 8b.
3. Plot the 1's on the K-Map in Fig. 8b.
4. Circle the 1's, eliminate the variables, and write the simplified minterm Boolean expression.
5. On a separate piece of paper, draw an AND-OR logic circuit for the Boolean expression.
6. On a separate piece of paper, re-draw the AND-OR logic circuit using only NAND gates and Inverters.
7. Insert the 7404, 7410, and 7420 ICs into the breadboard and wire the circuit. Test each input combination and make sure it gives the correct output. **Get Instructor's Signature.**

Inputs				Output	
A	B	C	D	Y	NAND Circuit
0	0	0	0	1	
0	0	0	1	1	
0	0	1	0	0	
0	0	1	1	0	
0	1	0	0	0	
0	1	0	1	0	
0	1	1	0	1	
0	1	1	1	1	
1	0	0	0	0	
1	0	0	1	0	
1	0	1	0	0	
1	0	1	1	1	
1	1	0	0	1	
1	1	0	1	1	
1	1	1	0	0	
1	1	1	1	0	

Table 8b

Fig. 8b

Unsimplified Boolean Expression:

Simplified Boolean Expression:
