

Experiment 11- Design and realization 2 bit comparator

AIM

To study the operation of a 4-bit magnitude comparator using IC 7485 with the help of the Future Tech Demonstration Board.

INTRODUCTION

Magnitude comparator is a logical circuit which compares two signals A and B, generates 3 logical outputs, $A > B$, $A < B$ and $A = B$. The need arises, while developing digital systems, to compare the bits of binary numbers or bit sequences. This may be to make conditional decisions, based on which, system starts performing different jobs.

- A) If the specific bit sequence / sequences or binary number/ numbers appears / appear.
- B) If the binary number / numbers is / are less than the specific binary.
- C) If the binary number/ numbers is/ are greater than the specific binary number / numbers, etc.,.

This is necessitated the development of ICs which are called binary magnitude comparators. The need suggests that there should be at least three different conditional outputs.

THEORY

The 7485 is a high speed, expandable 4 - bit magnitude comparator which compares two 4-bit words in any monolithic code (binary, BCD or other) and generates three outputs : A less than B, A greater than B and A equal to B. Three expansion inputs allow serial (ripple) expansion over any word length without external gates.

PIN NAMES	DESCRIPTION OF 7485
$A_0 - A_3$	Word A inputs
$B_0 - B_3$	Word B inputs
$I_A = B$	A = B Expansion input
$O_A > B$	A < B , A > B Expansion Inputs
$O_A < B$	A greater than B output
$O_A = B$	A equal to B output

EXPERIMENTAL PROCEDURE

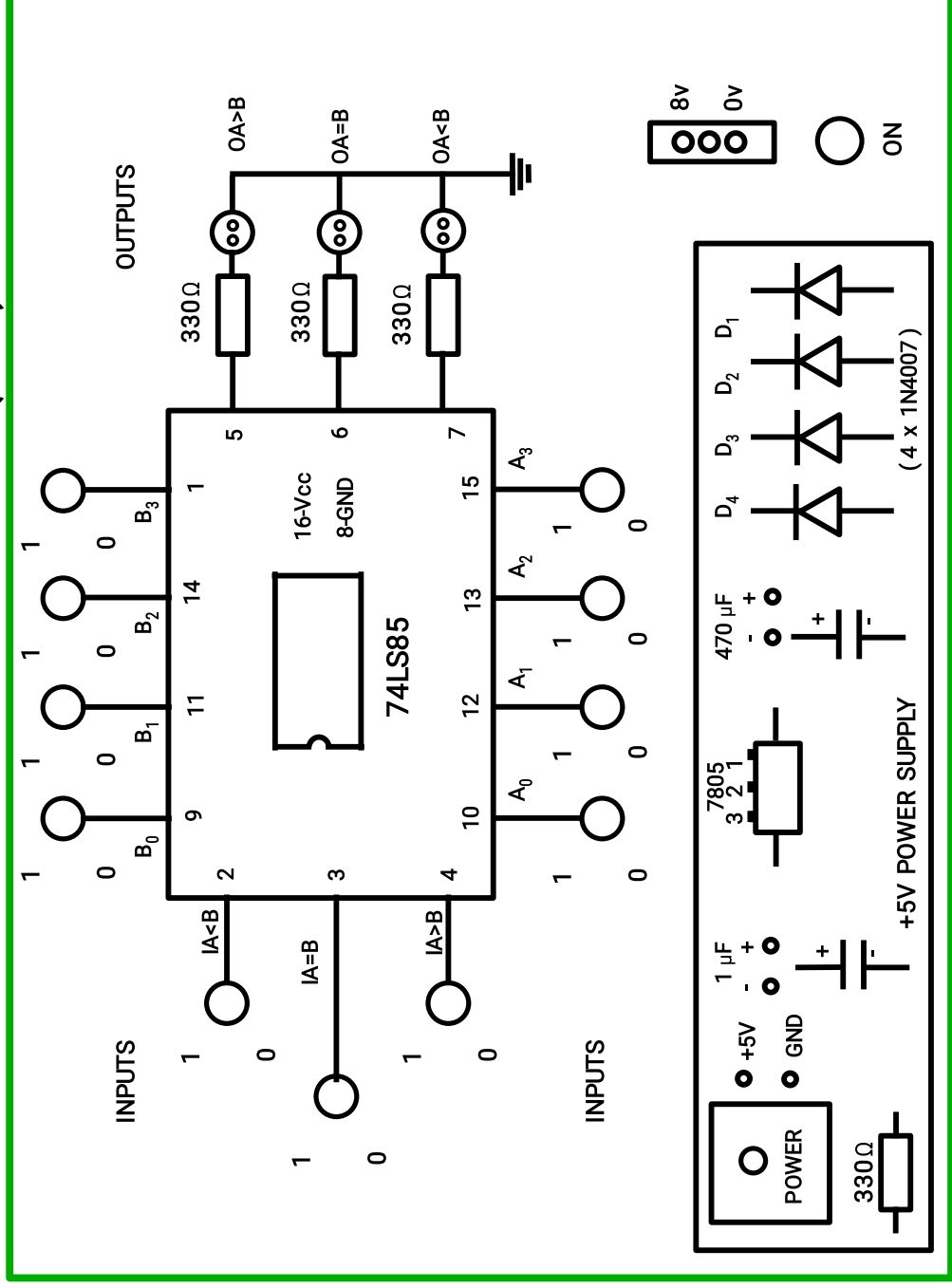
1. Switch ON the experimental board.
2. By changing the inputs A_3, A_2, A_1, A_0 and B_3, B_2, B_1, B_0 observe the outputs.

$A_3 A_2 A_1 A_0$	$B_3 B_2 B_1 B_0$	$I_A < B$	$I_A = B$	$I_A > B$
0 0 0 0	0 0 0 0	0	1	0
0 0 0 1	0 0 0 0	0	0	1
0 0 0 0	0 0 0 1	1	0	1

For all possible combinations of A_3, A_2, A_1, A_0 and B_3, B_2, B_1, B_0 the combination shows which is greater than the other or equal.

RESULT:

4 – BIT MAGNITUDE COMPARATOR (7485)



Panel diagram