

EC #2

Wasfi
Momen

Derive the control gates for the write input of the memory in the basic computer.

Write microoperations from 5-6, we look for all instructions that have data being written to memory. Hence, $MCAR \leftarrow$ ^{source}

$RT_1 \quad MCAR \leftarrow TR, PC \leftarrow 0$
 $D_3T_4 \quad MCAR \leftarrow AC, SC \leftarrow 0$
 $D_5T_4 \quad MCAR \leftarrow PC, AR \leftarrow AR + 1$
 $D_6T_6 \quad MCAR \leftarrow DR, SC \leftarrow 0$

By Figure 5-6 of the basic computer control unit, the outputs of the decoders can be used to express the function to create the write input of memory.

$$\text{Write input} = RT_1 + D_3T_4 + D_5T_4 + D_6T_6$$

Which can be simplified to

$$= RT_1 + T_4(D_3 + D_5) + D_6T_6$$

And now can be made into the following circuit.

