

北 京 邮 电 大 学

实 验 报 告

课程名称_计算机组成原理课程实验_

实验名称____运算器组成实验____

_计算机科学与技术_学院_2020211305_班 姓名_马天成_

教师_靳秀国老师_ 成绩_____

_2022_年_04_月_25_日

一：实验目的

- (1) 熟悉逻辑测试笔的使用方法。
- (2) 熟悉 TEC-8 模型计算机的节拍脉冲 T1、T2、T3。
- (3) 熟悉双端口通用寄存器组的读写操作。
- (4) 熟悉运算器的数据传送通路。
- (5) 验证 74LS181 的加、减、与、或功能。
- (6) 按给定的数据，完成逻辑、算术运算。

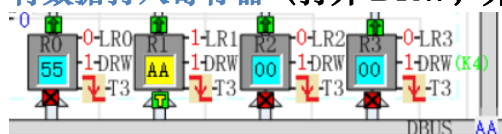
二：实验过程

内容 1：

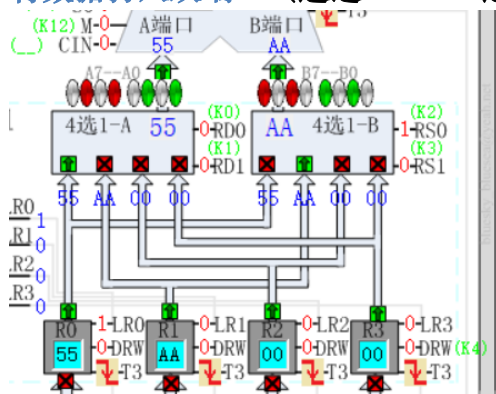
A=55H, B=AAH 完成算术运算，逻辑运算，将运算结果填入表格中，并分析数据

(内容 1 详细描述过程，内容 2 非核心内容 1 省略，但 LDC LDZ 功能在内容 2 中做了实验)

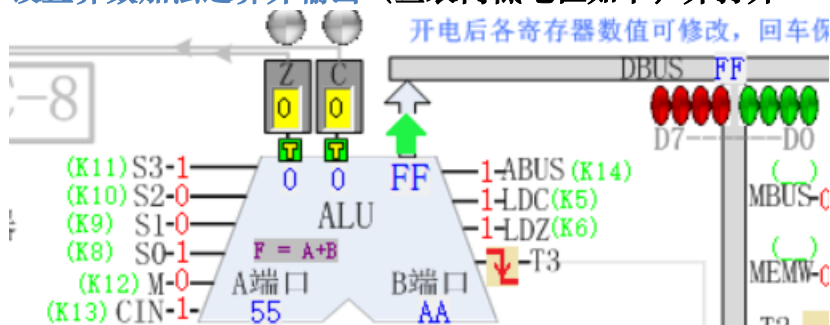
1. 将数据打入寄存器 (打开 DRW，并在输入完后关闭，避免数据被覆盖)



2. 将数据打入双端口 (通过 RD RS 选择寄存器数据)

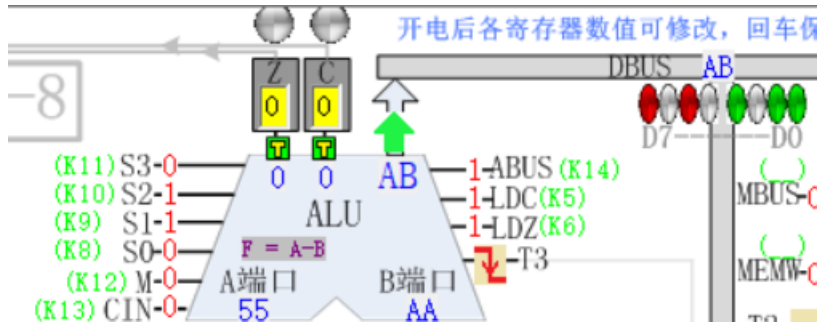


3. 设置算术加法运算并输出 (查表高低电位如下，并打开 ABUS 使得答案输出为灯)

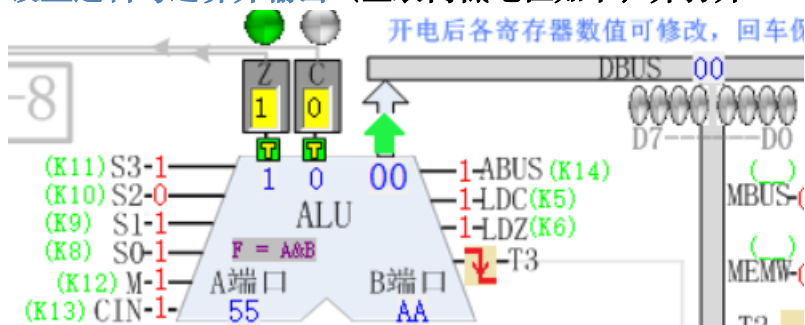


易知：55 H + AA H = FF H

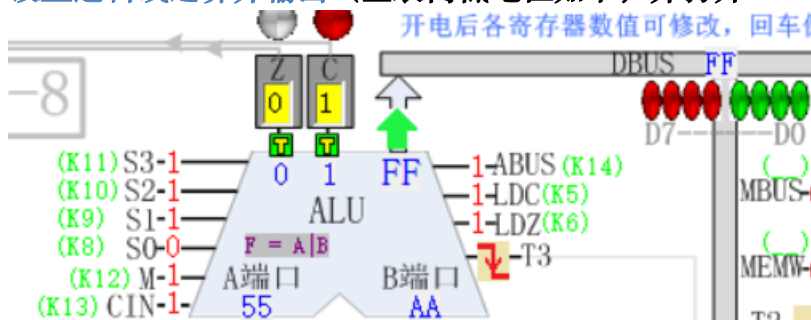
4. 设置算数减法运算并输出 (查表高低电位如下, 并打开 ABUS 使得答案输出为灯)



5. 设置逻辑与运算并输出 (查表高低电位如下, 并打开 ABUS 使得答案输出为灯)



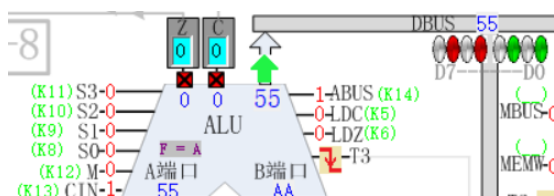
6. 设置逻辑或运算并输出 (查表高低电位如下, 并打开 ABUS 使得答案输出为灯)



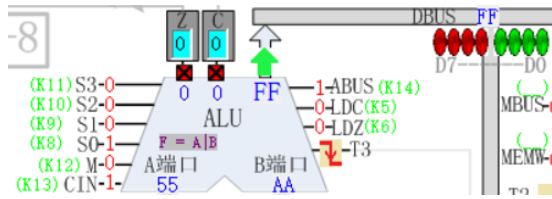
以下是所有正逻辑输入与输出

7. 设置所有算数运算并输出

0000:



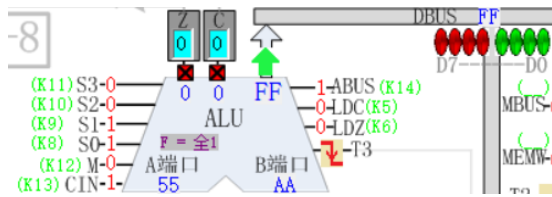
0001:



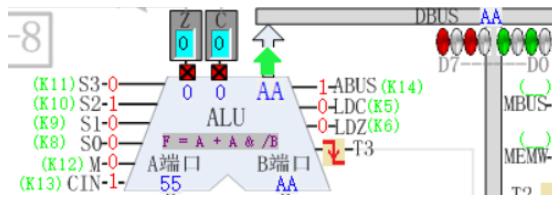
0010:



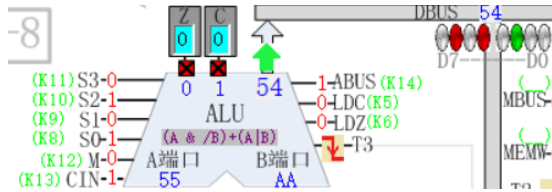
0011:



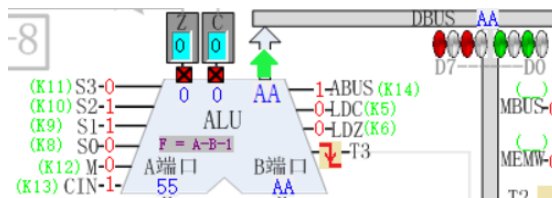
0100:



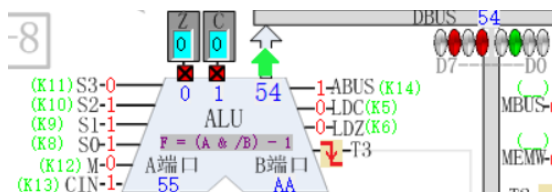
0101:



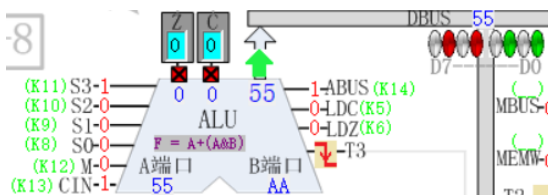
0110:



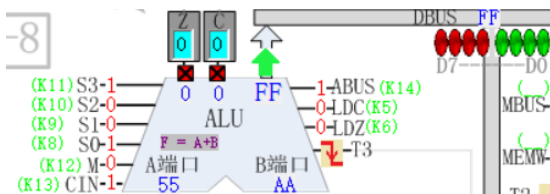
0111:



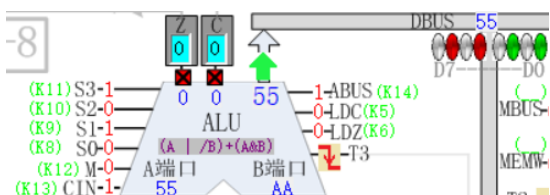
1000:



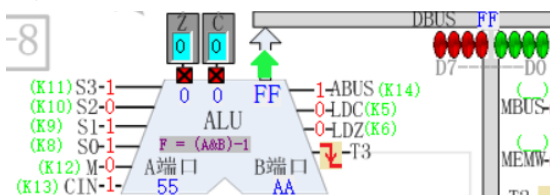
1001:



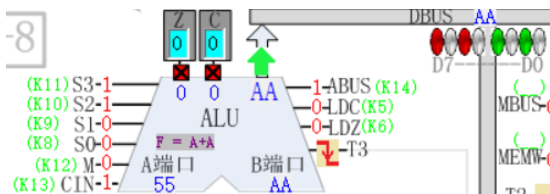
1010:



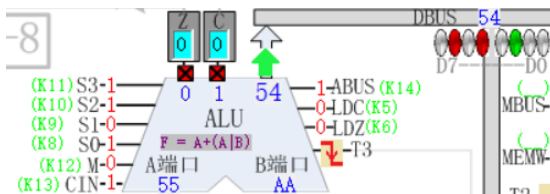
1011:



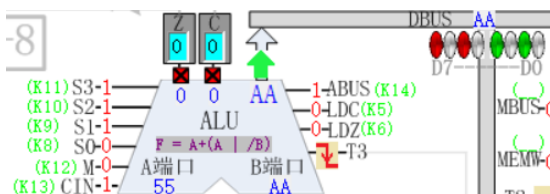
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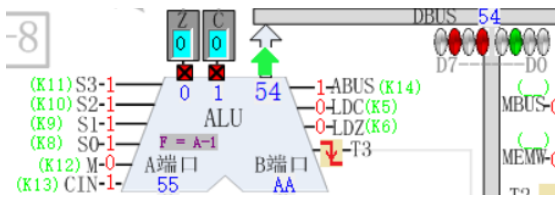
1101:



1110:

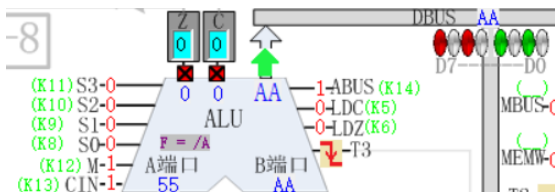


1111:

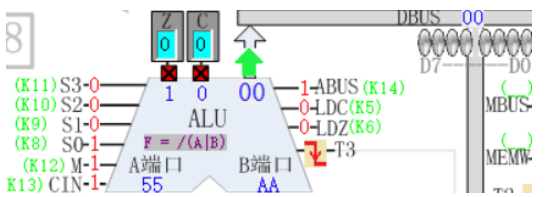


8. 设置所有逻辑运算并输出

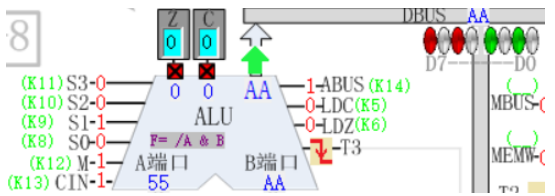
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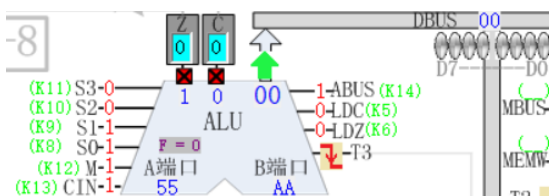
0001:



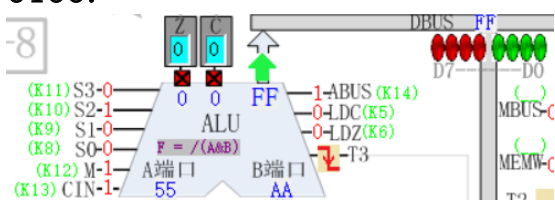
0010:



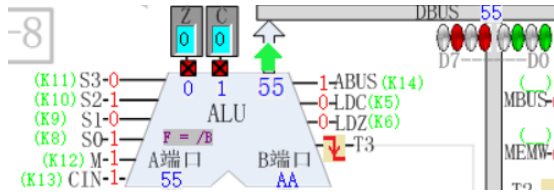
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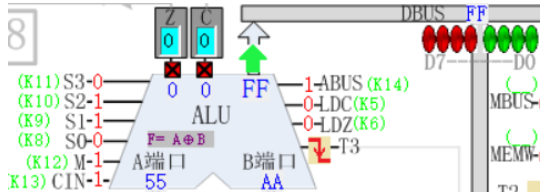
0100:



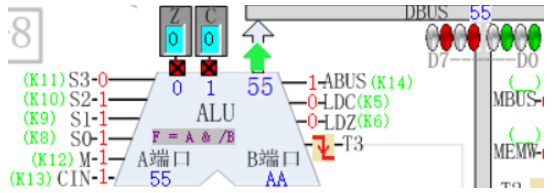
0101:



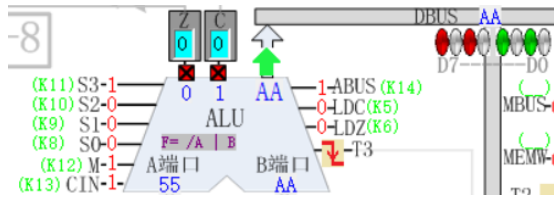
0110:



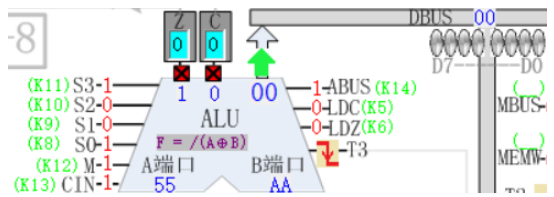
0111:



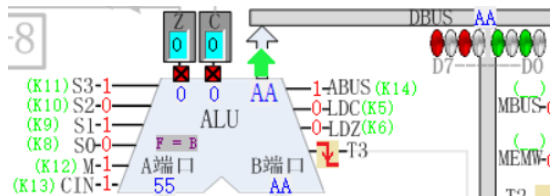
1000:



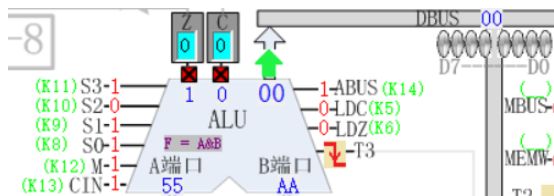
1001:



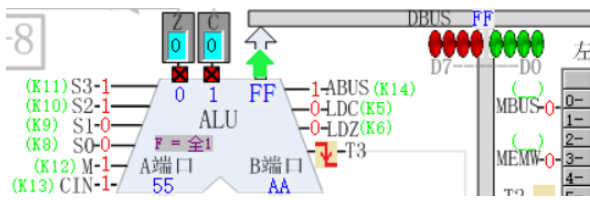
1010:



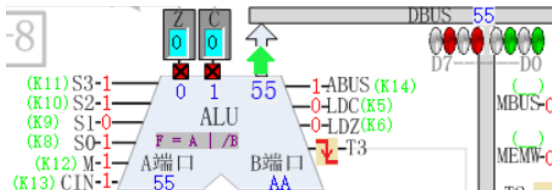
1011:



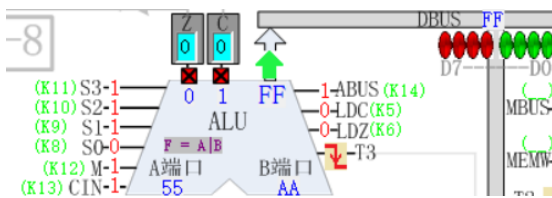
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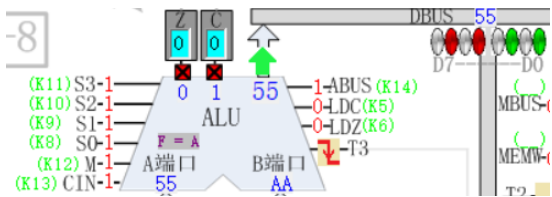
1101:



1110:



1111:



总结:

1. M 是用来切换逻辑运算和算术运算，通过 S0,S1,S2,S3 和 CIN 通过不同的组合完成不同的运算。
2. ABUS: 传送运算结果到数据总线
3. LDC: 获取进位标志
4. LDZ: 获取判断是否为 0

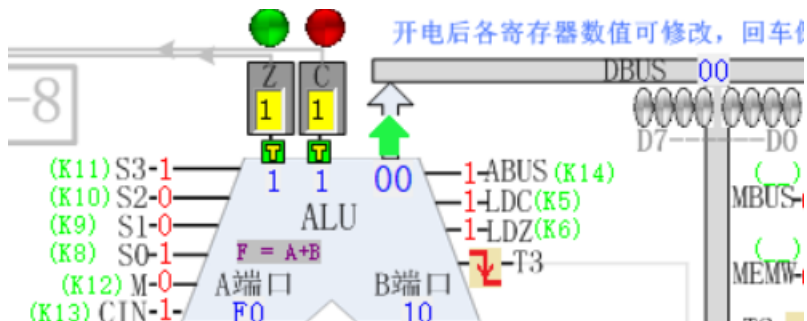
内容二：

对下列 7 组数据进行加、减、与、或运算。

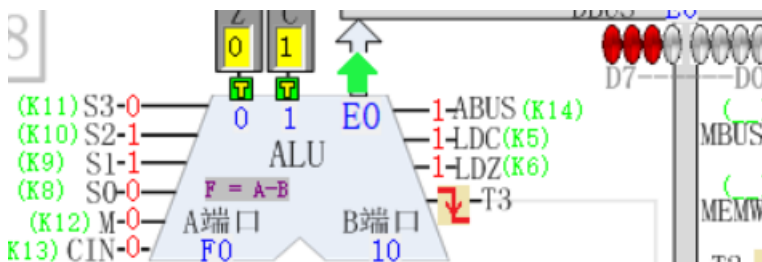
(重大问题：在做内容 1 时没有打开 LDC，LDZ，所以做完内容 2 后结论 1 补充了这两个)

1. A=F0H B=10H

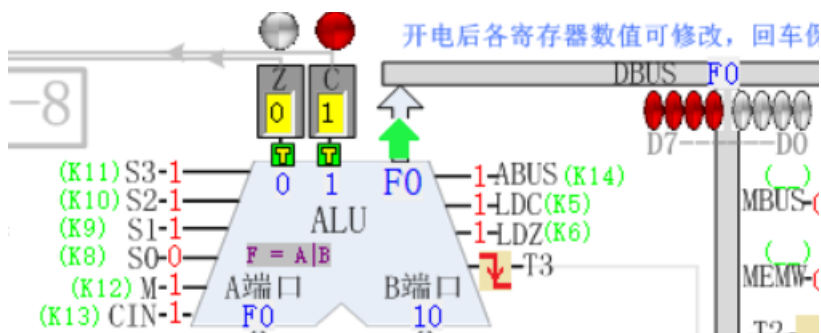
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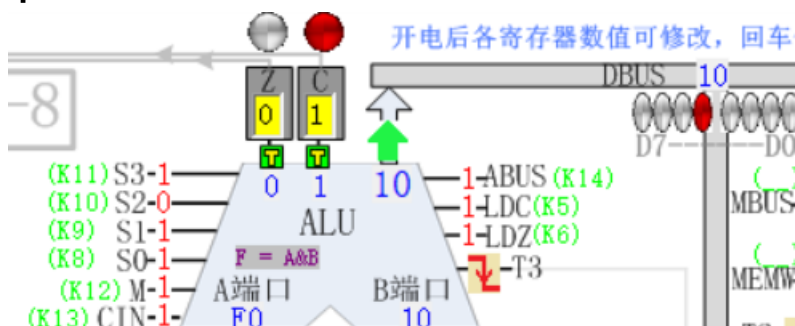
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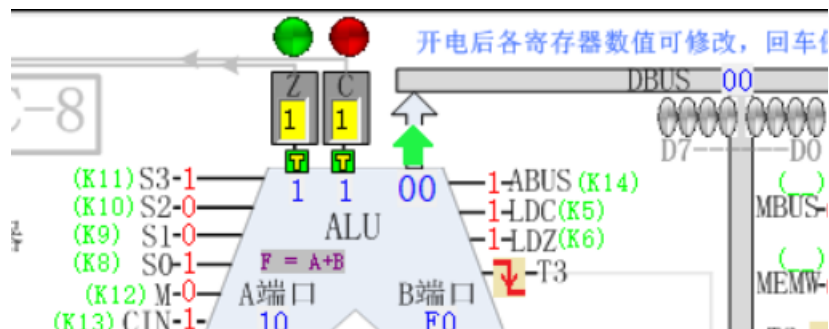


|:

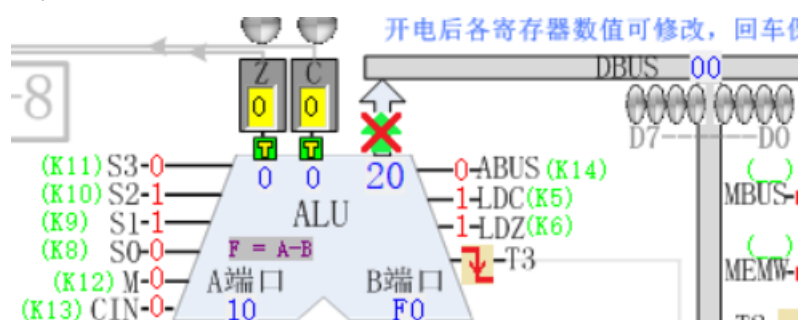


2. A=10H B=F0H

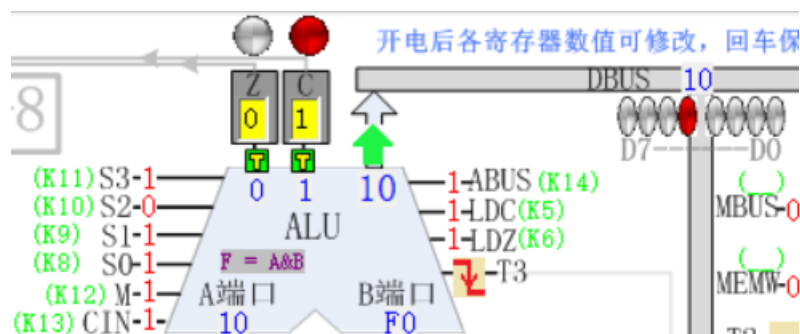
+:



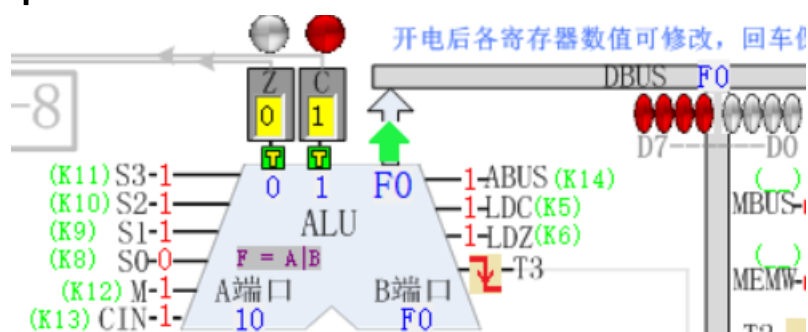
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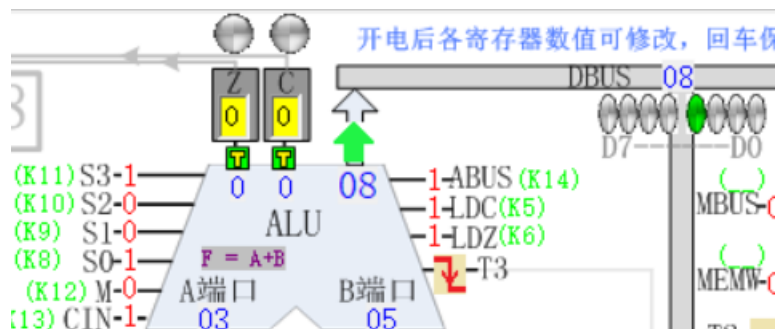


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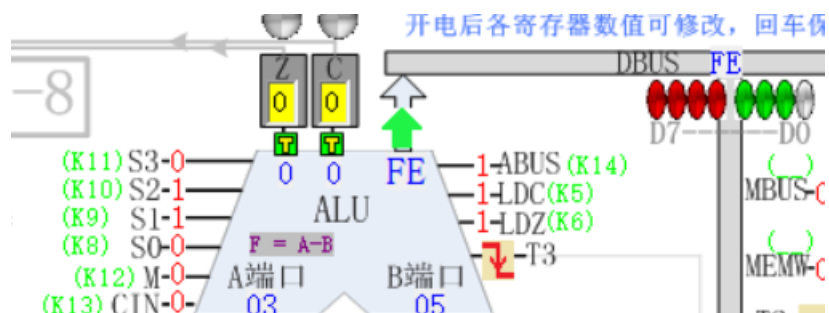


3. A=03H B=05H

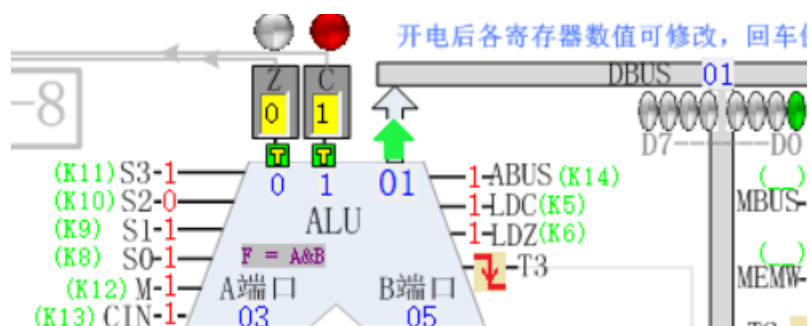
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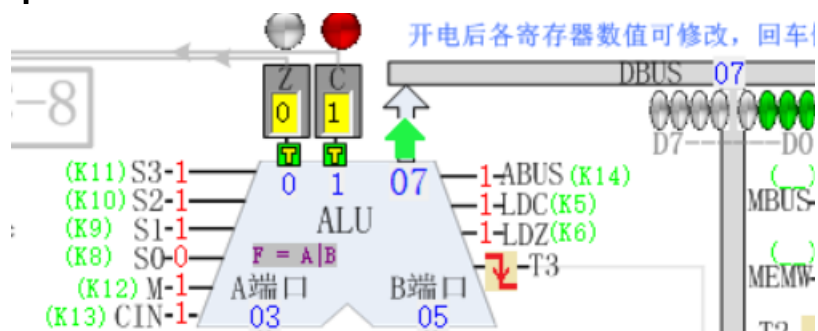
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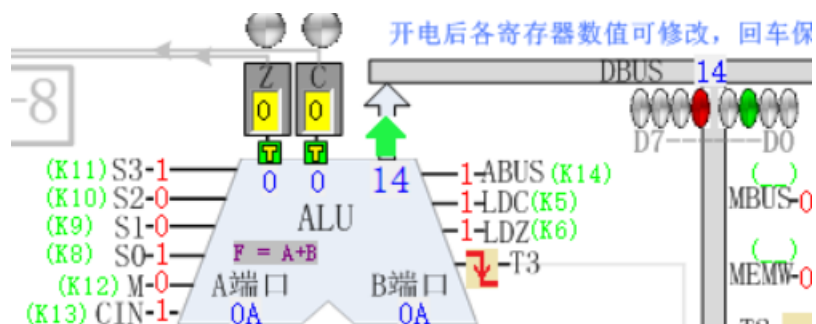


|:

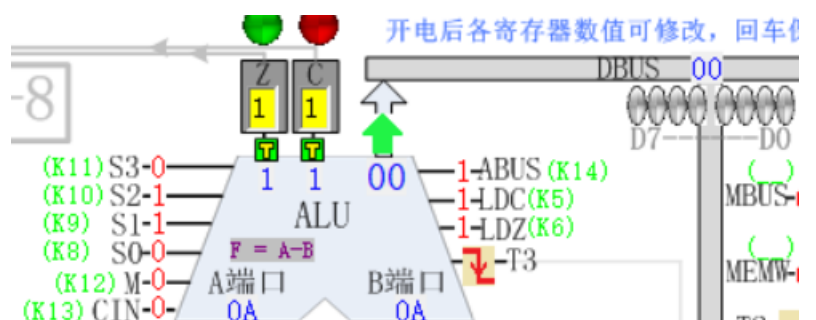


4. A=0AH B=0AH

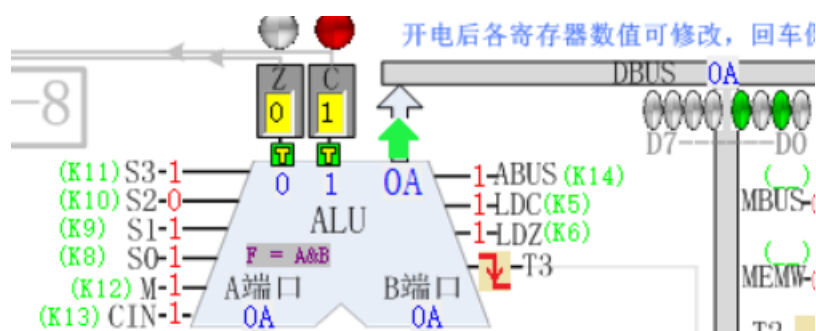
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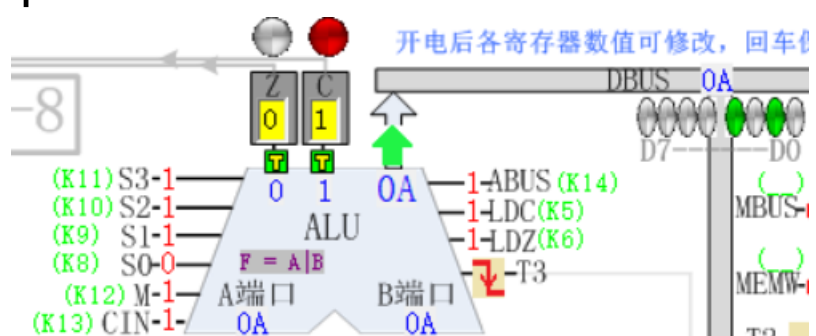
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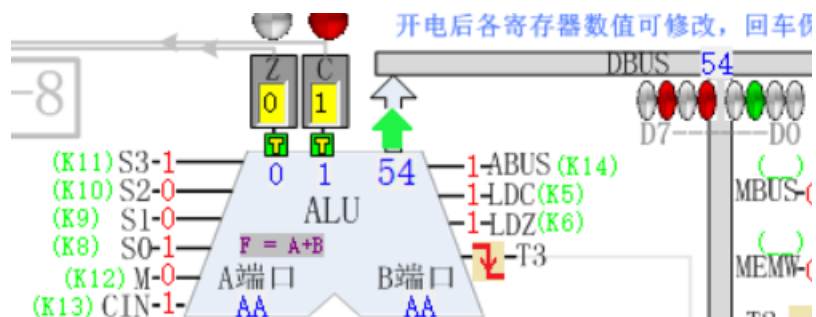


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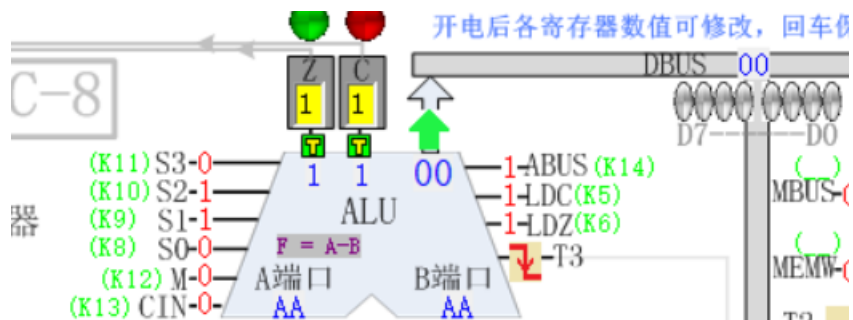


5. A=FFH B=AAH

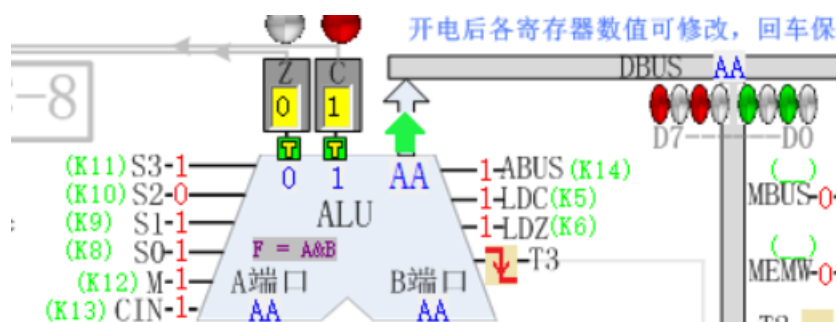
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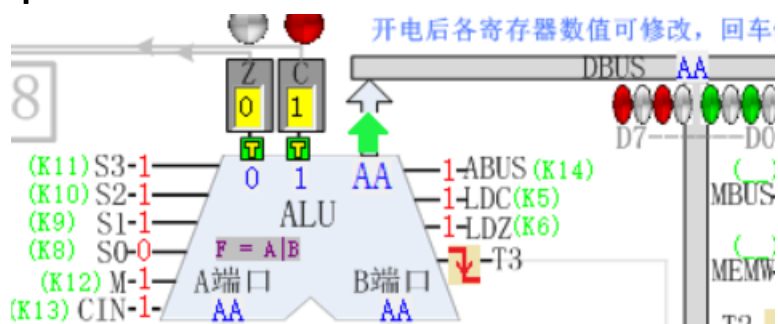
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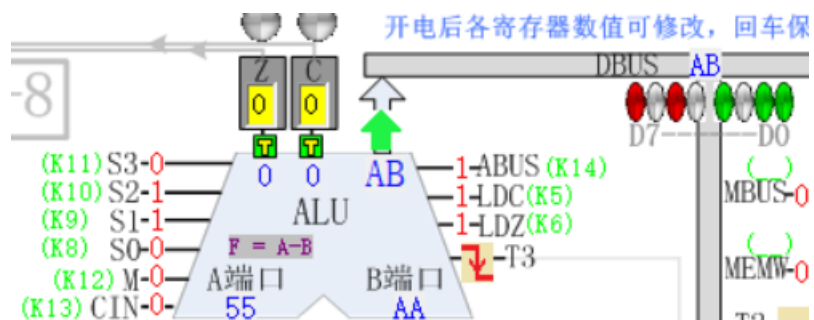


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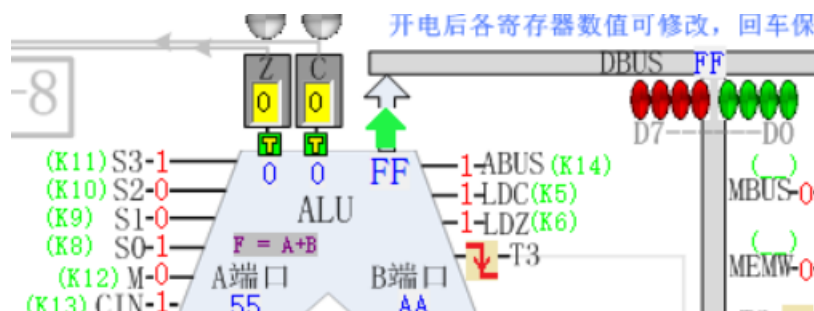


6. A=55H B=AAH

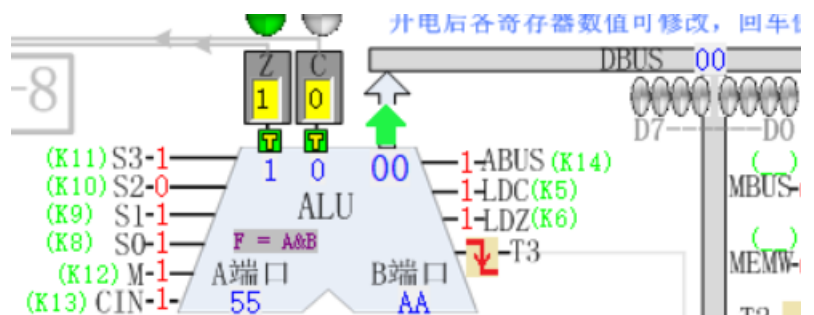
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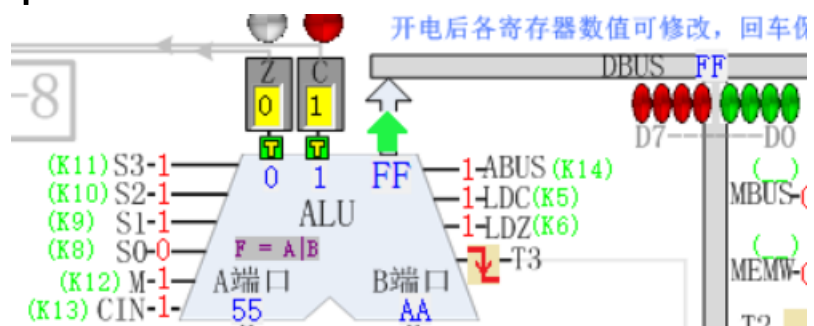
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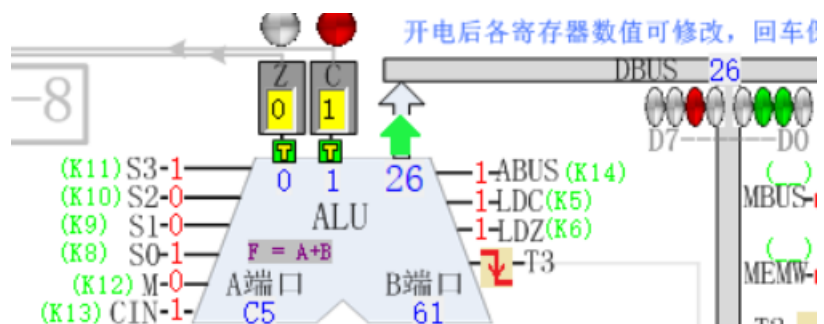


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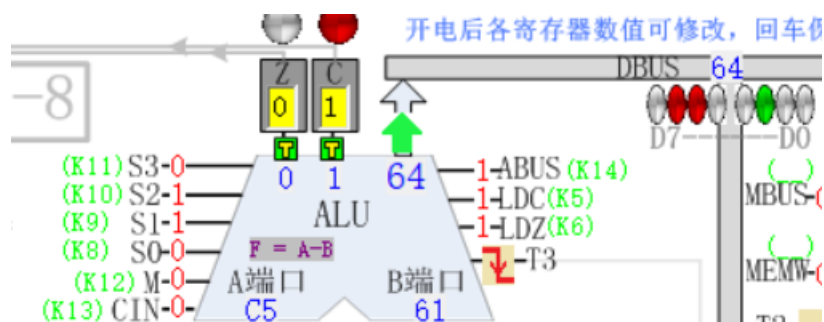


7. A=C5H B=61H

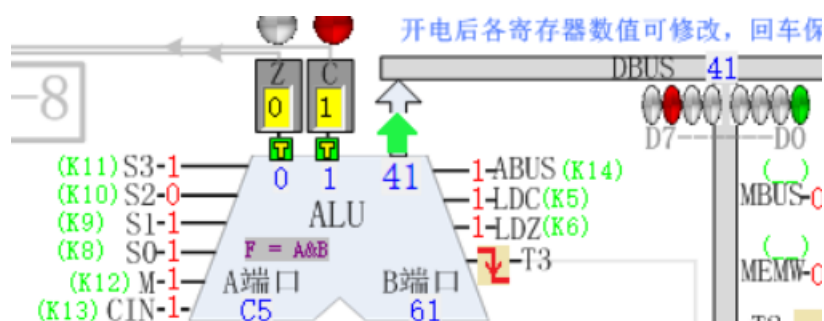
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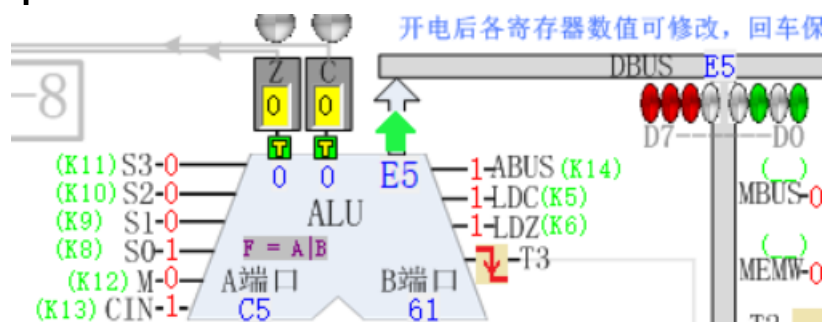
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三、实验总结

1. 如何利用 TEC-8 模拟仿真系统，对运算器的每个接口有一个相对深刻的认识，尤其是运算器的 LDC LDZ。
2. 对运算器的工作原理有了较深刻的理解，同时对运算器的逻辑运算与算数运算机制有了比较深刻的理解。

