

4-bit microprocessor

MARA KHA



Low budget Intel

420, Downtown, London

**74LS126**

**74LS126**

**4 Bit Buffer**

**4 Bit Buffer**

4 Bit

4 Bit

**Accumulator A**

**PC**

4 Bit

**4 Bit Register**

**74LS193**

**74LS173**

4 Bit

4 Bit

**4 Bit Buffer**

4 Bit

4 Bit

**4 Bit ALU**

**MAR**

**74LS126**

**74LS181**

**74LS173**

**8 Bit Bus**

**74LS157**

4 Bit

**MUX**

**Address**

**B**

**Higher 4bit**

**Lower 4bit**

**74LS173**

**4 Bit Register**

8 Bit

4 Bit

**RAM**

**RAM**

**74LS189**

**74LS189**

High 4 Bit

Low 4 Bit

**Output**

4 Bit

**IR**

**IR**

Low4 Bit

**74LS173**

**74LS173**

**4 Bit Register**

**74LS173**

4 Bit

High 4 Bit

**Binary  
Display**

**Control Sequencer**

**7 Segment BCD**

**Control word format:**

|  |  |  |  |
| --- | --- | --- | --- |
| Macro | State | CON(HEX) | Active |
| Fetch |  | DE3 | *,* |
|  | 1663 | *, ,* |
| LDA |  | 05A3 | , |
|  | 06C3 |  |
| MOV |  | 07F1 | , |
|  | 07E3 | NOP |
| INR |  | 07C7 | , |
|  | 07E3 | NOP |
| AND |  | 07CF | , *,* |
|  | 07E3 | NOP |
| JM  When SF=1 |  | 03A3 |  |
|  | 07E3 | NOP |
| OUT |  | 07F2 | , |
|  | 07E3 | NOP |
| HALT |  | 07E3 | NOP |
|  | 07E3 | NOP |

**Control matrix design:**

LDA=

MOV=

INR=

AND=

JM=

OUT=

HALT=