

DDDD	III	OOO	1	1
D D	I	O O	11	11
D D	I	O O	1	1
D D	I	O O	1	1
DDDD	III	OOO	111	111

Digital Input/Output Module

User's Guide

August 1979

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Andromeda Systems, Incorporated
9000 Eton Avenue
Canoga Park, CA 91304
(213) 709-7600

DIO11

Digital Input/Output Module

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1. Scope

This user's guide for the Andromeda Systems, Incorporated DIO11 Digital Input/Output Module describes the capabilities and installation of the DIO11. The reader is assumed to be familiar with the details of I/O programming on an LSI-11 computer system. For more information, consult the DEC Microcomputer Processors handbook.

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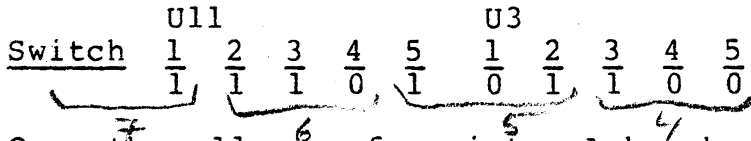
2. Description

The DIO11 Digital Input/Output Module is a dual-width module which plugs directly into an LSI-11 computer system. It provides all of the logic necessary to implement four 16 bit registers (designated A, B, C, and D) and interface them to the LSI-11 Q-bus. The 64 bits output by these registers are available on two standard 40 pin connectors. These bits may be converted to inputs by a simple hardware modification requiring no tools.

Four other signals are provided on the output connectors. These are pulses occurring whenever the low byte of any of the registers is loaded. In addition, the DIO11 also contains a unique "user area" on the board, where custom circuitry may be installed. Power (+5v.), all of the LSI-11 bus signals, and the upper 8 bits of register A (along with their corresponding I/O lines) are available for user connection.

3. Installation

The DIO11 uses four contiguous Q-bus locations, one for each register. The address of register A is specified by means of two 5 position DIP switches at board locations U11 and U3. Each switch is labelled 1-5. At U11, these correspond to address bits 12-8 respectively. At U3, they correspond to address bits 7-3 respectively. Depressing a switch on the side labelled "+" or "ON" denotes a "0" in the address while the other side, blank or "OFF", denotes a "1". For example, a DIO11 configured to reside at Q-bus locations 176540-176547 would have its switches set as follows:



Once the address of register A has been set, the other registers are addressed as follows:

<u>Register</u>	<u>Address</u>
B	A+2
C	A+4
D	A+6

The registers may be addressed in byte mode. For example, the address of the high byte of register C would be A+5.

There are 8 chips which are socketed on the module. These are the 8 bit registers. To convert 8 of the DIO11 bits to inputs, remove the corresponding register chip. If desired, two 10 pin, 10K resistor pacs (Beckman part number 4310R-101-103) may be installed in the socket to insure that unused inputs will always be read as "1". Install the resistor pacs with the banded ends at pins 1 and 20 (the two pins closest to the I/O connectors). The 8 bit register chips are assigned as follows:

<u>Register</u>	<u>Low Byte</u>	<u>High Byte</u>
A	U31	U21
B	U33	U23
C	U35	U25
D	U37	U27

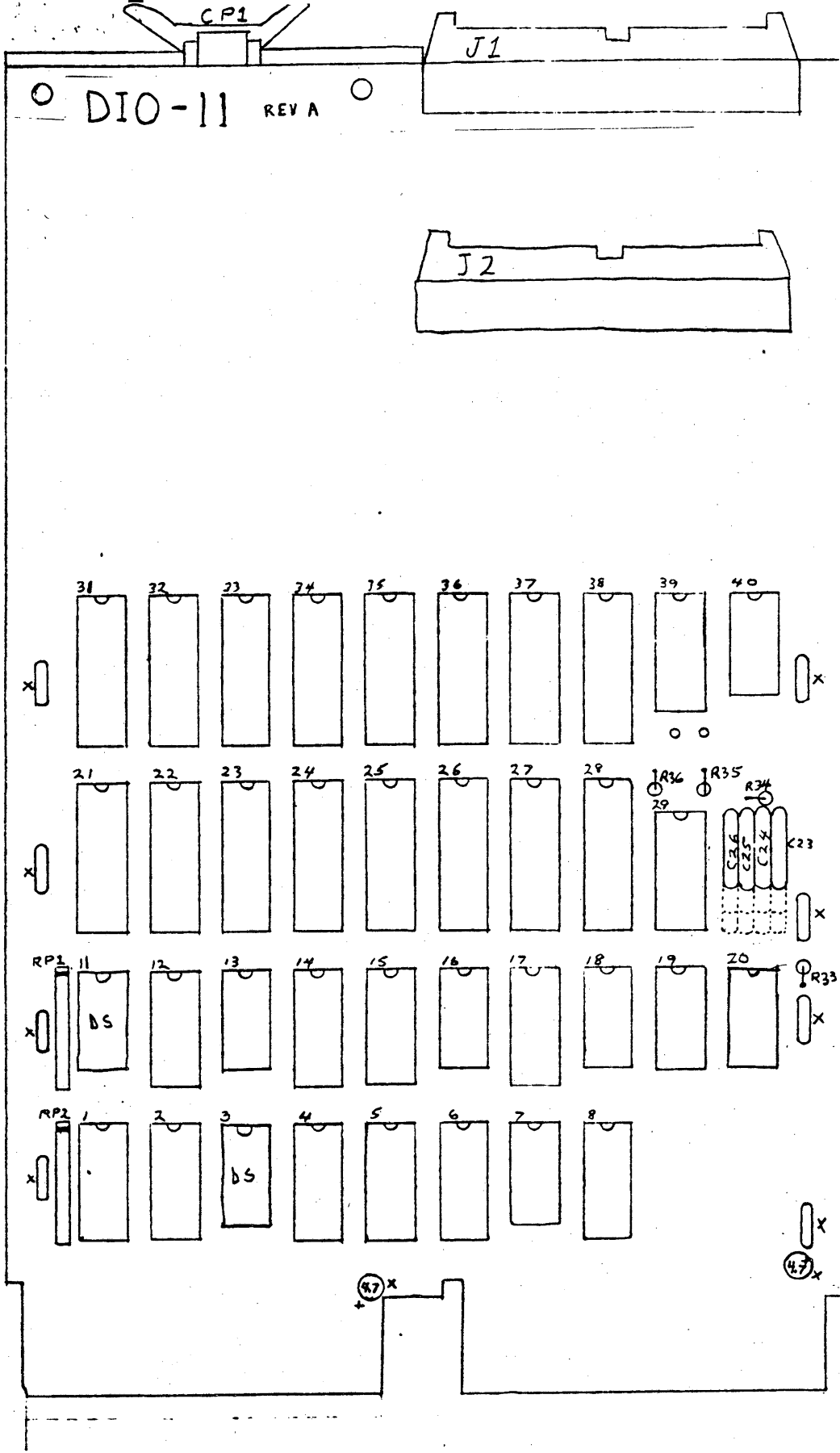
Any combination of inputs and outputs is available. Inputs and outputs may be assigned at the bit level by bending the appropriate register output pin so that it does not plug into the socket. Refer to appendix A for the specific location of each bit.

There are 8 jumpers near the "user area" labelled A8-A15. These correspond to the upper 8 bits of register A. These may be used as outputs to custom circuitry, or as inputs to the LSI-11 from custom circuitry. Also, by cutting one of the jumpers (on the bottom of the board), custom circuitry may use that I/O line to communicate with whatever peripheral device is on the other end of the 40 line cable.

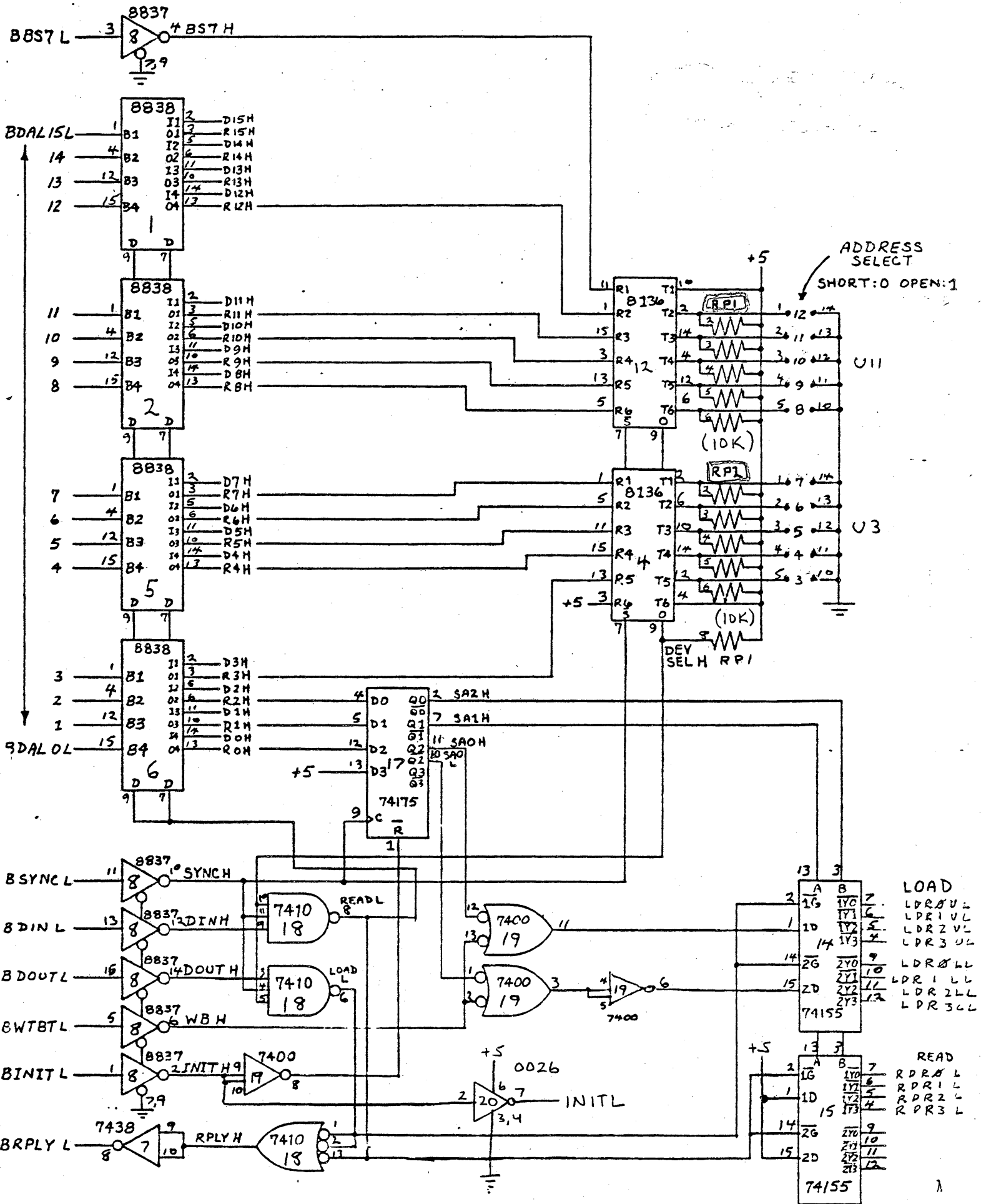
The two I/O connectors (J1 and J2) are assigned as follows:

<u>J1</u>		<u>J2</u>	
1. A14	2. GND	1. C14	2. GND
3. B15	4. B14	3. D15	4. D14
5. A12	6. A15	5. C12	6. C15
7. B13	8. B12	7. D13	8. D12
9. A10	10. A13	9. C10	10. C13
11. B11	12. B10	11. D11	12. D10
13. A8	14. A11	13. C8	14. C11
15. B9	16. B8	15. D9	16. D8
17. A6	18. A9	17. C6	18. C9
19. B7	20. B6	19. D7	20. D6
21. A4	22. A7	21. C4	22. C7
23. B5	24. B4	23. D5	24. D4
25. A2	26. A5	25. C2	26. C5
27. B3	28. B2	27. D3	28. D2
29. A0	30. A3	29. C0	30. C3
31. B1	32. B0	31. D1	32. D0
33. GND	34. A1	33. GND	34. C1
35. GND	36. GND	35. GND	36. GND
37. GND	38. A Pulse	37. GND	38. C Pulse
39. GND	40. B Pulse	39. GND	40. D Pulse

Appendix A
Logic Diagrams



DIO-11 STUFFING GUIDE

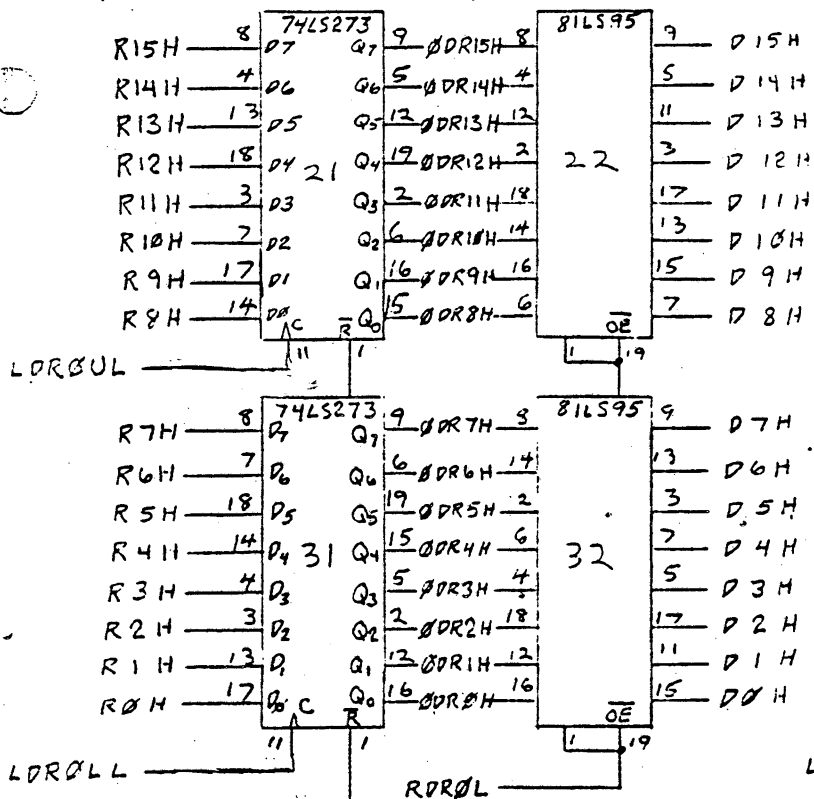


DIO11 DATA REGISTERS.

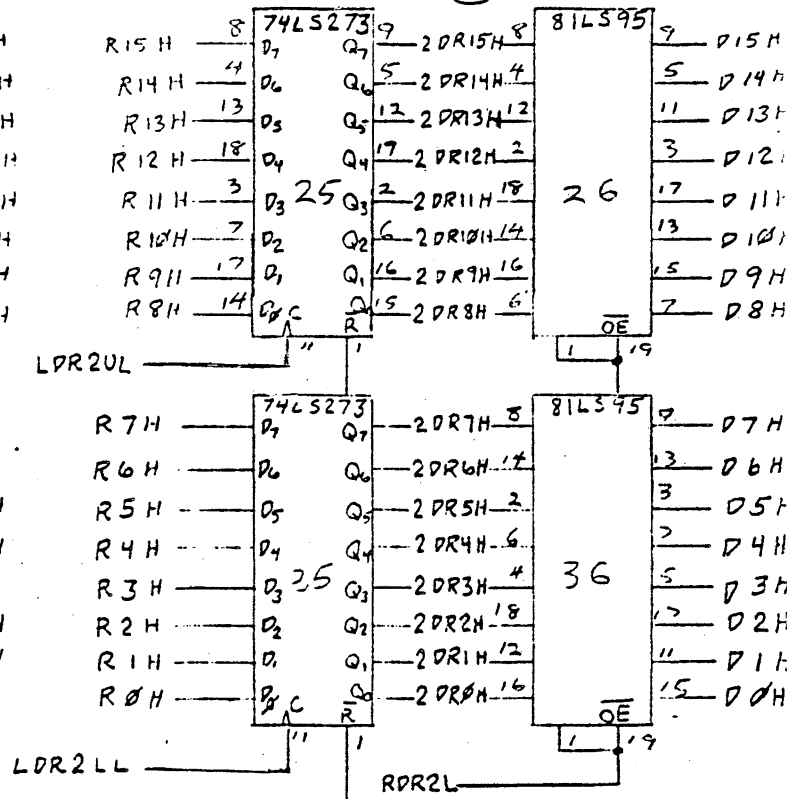
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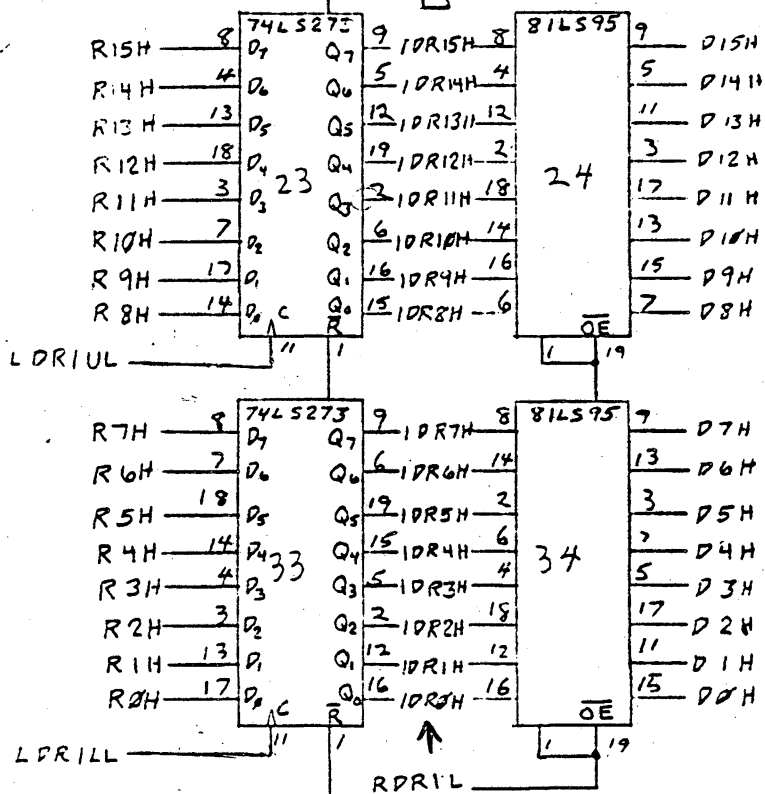
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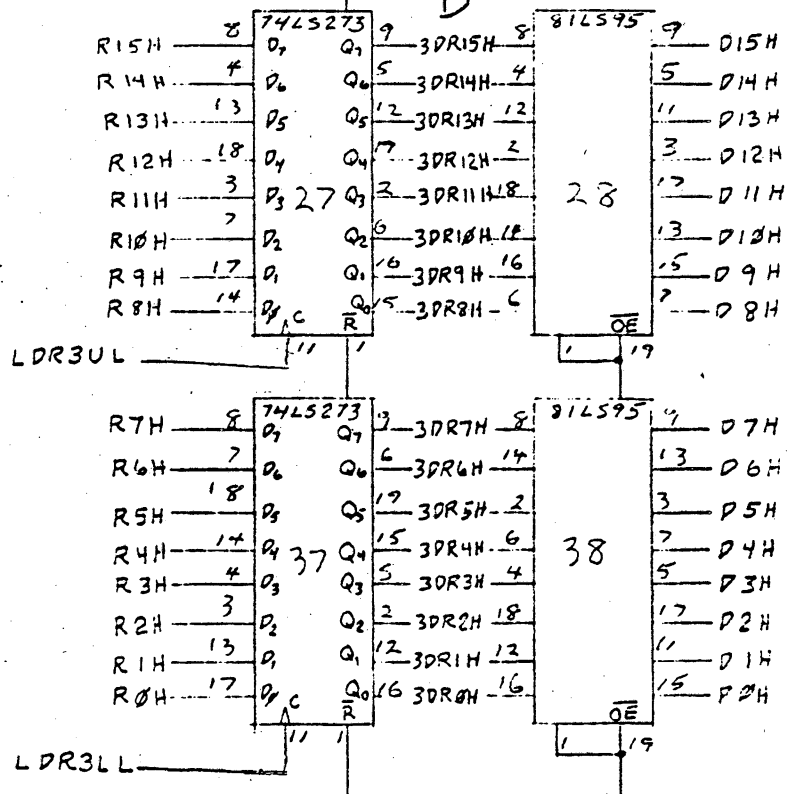
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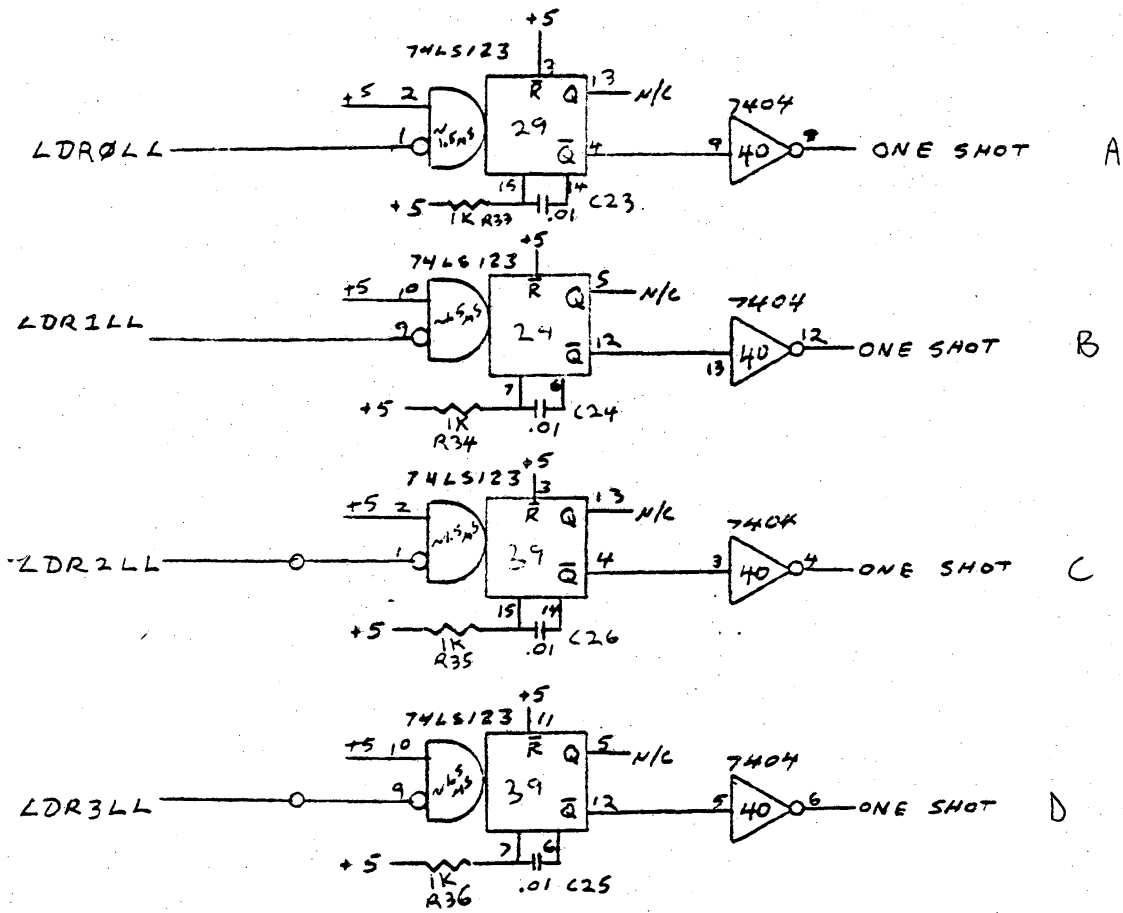
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D



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Notes