

DOUT32 Parts List (in order of recommended assembly)

Qty.	Symbol	Description
1	S1	16-pin DIP socket (Jameco 112221)
6	S2-S7	20-pin DIP sockets (Jameco 112248)
1	S8	14-pin DIP socket (Jameco 112213)
1	RN1	2.2K Ω 7-element SIP resistor network (Digi-Key 770-81-R2.2K)
4	RN2-RN5	470 Ω 8-element DIP resistor networks (Jameco 108581)
4	RN6-RN9	4.7K Ω 9-element SIP resistor networks (Jameco 24660)
1	SW1	6-segment DIP switch (Digi-Key CT2066)
2	H1,H2	12-pin Waldom side entry connectors (Mouser 538-09-52-3121)
1	H3	32-pin Waldom right angle header (make from 24-pin right angle headers Mouser 538-26-48-1242 – see text)
8	C1-C8	.1 μ F, 50V monolithic capacitors (JDR .1UF-MONO)
2	C9,C10	2.2 μ F, 16V tantalum capacitors (Jameco 94001)
32	Q1-Q32	2N4401 NPN small signal transistors (Jameco 38421) for standard current sinking or 2N4403 PNP small signal transistors (Jameco 38447 when using current sourcing)
1	J1-J4	Install long jumper at each of 4 locations for standard current sinking or short jumper when using current sinking per text. (make from spare ends of resistors leads)
1	U1	74LS138 3-to-8 decoder (Jameco 46607)
1	U2	74HCT688 8-bit magnitude comparator (Jameco 45129)
4	U3-U6	74HCT573 octal D-type latched flip-flops (Jameco 45090)
1	U7	74LS541 octal non-inverting buffer/line driver (Jameco 47870)
1	U8	74LS04 hex inverter (Jameco 46316)
		Mating connector for cable
4	—	8-pin Waldom terminal housings (Mouser 538-09-50-3081))
32	—	Crimp terminals (Mouser 538-08-50-0106 for wire sizes 18-20 or 538-08-50-0108 for wire sizes 22-26)

Author's recommendations for suppliers given in parentheses above with part numbers where applicable. Equivalent parts may be substituted.

General Information:

Assembly follows the same basic steps as the DOUT card covered in the Second Edition Build Your Own Universal Computer Interface book and in the C/MRI User's Manual except that the parts legend is printed directly on the card making the assembly easier. If you have assembled a DOUT card, assembling the DOUT32 should be a snap. If you have never assembled a DOUT card, I recommend you review the DOUT card's instructions before assembling the DOUT32 card.

Information notes on DOUT32 card assembly:

1. Make sure that all the IC sockets and the ICs are installed with the correct pin 1 orientation. The pin 1 holes also have the square pad for easy identification.
2. The SIP resistor networks RN1 and RN6-RN9 have a designated pin 1 orientation denoted by either a dot or a bar printed on the part. The designated pin 1 must be installed in the hole marked with a one as well as having the square pad.

3. Orientation of the DIP resistor networks RN2-RN5 isn't important but for consistency in appearance, it's best to align them just like the ICs.
4. Installing DIP switch, SW1, use your VOM to make certain that the switch is installed so its contacts are closed when thrown toward C9. This may well make the switch read like it is upside down, but this position is absolutely critical to setting correct card addresses.
5. Install the 12-contact side entry connectors, H1-H2, by first hooking their nylon retaining fingers over the edge of the card, then feeding the metal contact pins through the card holes. Make sure all 12 pins of each connector pass through the hole. Hold the connector shell tightly against the card as you solder.
6. The right angle header specified for H3 is made from 24-pin right angle headers. Simply cut and snap off the required sections from standard 24-pin headers to create the needed 32-pin header.
7. When installing the H3 header, make sure you have the plastic part of the connector pushed firmly against the card before soldering. Solder only a pin or two of each section. Check to make sure that the complete plastic base is snugly pressed firmly against the card. If not, reheat the connections to reseat the connector. Once you are certain that the total 32-pins are firmly seated, then solder the remaining pins.
8. Capacitors C1-C8 are not polarity sensitive. Simply insert, solder and trim.
9. Capacitors C9, C10 are polarity sensitivity. The longer lead needs to be installed into the + holes. The + holes also have the square pad for easy identification.
10. Before installing the transistors Q1-Q32 you need to decide if you want standard current sinking or alternate current sourcing. Review the instructions for the DOUT card if unsure as to which is best for your particular application. The DOUT32 card's design provides for individual port selection. However, for the sake of keeping things simple, and being able to easily interchange cards of the same type, I recommend that you make all the ports the same for a given card. To install the transistors bend the center lead back a bit so that each transistor fits into its designated three holes following the orientation printed on the card. Push each transistor into its corresponding holes until there is about a 1/8 inch space between the board and the bottom of the transistor. With all the transistors lined up evenly solder and trim the leads.
11. Install the long jumper in the J1-J4 locations corresponding to each port that uses the 2N4401 transistor, i.e. current sinking. Install the short jumper in the J1-J4 locations corresponding to each port that uses the 2N4403 transistor, i.e. current sourcing.