

Color Codes	Omit if serial ports are not needed																			
	Omit if USB not needed																			
	Do not substitute logic family																			
	ICs can be moved from v3 to v4 board																			
<b>v4 H8-Z80-64K/DUART/CLOCK-CNTL/RTC/ORG0 Bill of Materials</b>																				
Component #	Value	v4 Qty	Cost	Extended	Socket	Jameco	Mouser	Amazon	Pololu	eBay	Tayda	Notes								
Bypass Caps (one per IC)	0.1 uF	39	\$ 0.25	\$ 9.75			<a href="#">332672</a>					Buy from Mouser - 100-pcs for \$5.50								
C2, C14, C17, C20, C21, C46	2.2 uF (Tantalum)	6	\$ 0.59	\$ 3.54			<a href="#">33736</a>					Capacitor Tantalum 2.2 uF 35 Volt 10%								
C3, C4, C5, C6	2.2 uF (Tantalum)	4	\$ 0.59	\$ 2.36			<a href="#">33736</a>					1 uF 35 Volt Tantalum Capacitor								
C10	1 uF (Tantalum)	1	\$ 0.49	\$ 0.49			<a href="#">33662</a>					33uF 25 VOLT TANTALUM CAPACITOR								
C1, C13	33 uF (Tantalum)	2	\$ 1.95	\$ 3.90			<a href="#">33785</a>					Capacitor NPO Monolithic Ceramic 22pF 100V ±5% (Bulk in units of 10)								
C7, C11, C12	22 pF	3	\$ 0.29	\$ 0.87			<a href="#">332541</a>					Can also use 1N4148 instead from Jameco.								
D2, D6, D7, D8, D9, D10	1N4149	6	\$ 0.10	\$ 0.60																
D1	5mm green LED (Power LED)	1	\$ 0.15	\$ 0.15			<a href="#">34761</a>					Substitute for color or size as desired (bulk in units of 10)								
D3	5mm Blue LED (HALT LED)	1	\$ 0.39	\$ 0.39			<a href="#">Super Bright Blue LED 5mm Water Clear 12000mcd</a>					HALT LED								
D4, D5	1N5819	2	\$ 0.35	\$ 0.70			<a href="#">177965</a>					Bulk (in units of 10)								
Q1, Q2, Q3	2N3904	3	\$ 0.15	\$ 0.45			<a href="#">38359</a>					Transistor 2N3904 NPN General Purpose (Bulk in units of 10)								
R503	100	1	\$ 0.06	\$ 0.60			<a href="#">690620</a>					Bulk (in units of 10)								
R29	33	1	\$ 0.06	\$ 0.60			<a href="#">690507</a>													
R1, R3, R9	330	3	\$ 0.06	\$ 0.60			<a href="#">690742</a>					Bulk (in units of 10)								
R10, R23	3.3K	2	\$ 0.06	\$ 0.60			<a href="#">690988</a>					Bulk (in units of 10)								
R2	100 OHM 1 WATT	1	\$ 0.14	\$ 1.40			<a href="#">2237159</a>					Bulk (in units of 10)								
R13, R14, R15, R20, R24, R26, R27, R28, R501, R502, R504	1K	11	\$ 0.06	\$ 1.20			<a href="#">690865</a>					Bulk (in units of 10)								
R6, R7, R8, R12, R18, R19	2.2K	6	\$ 0.06	\$ 0.60			<a href="#">690945</a>					Bulk (in units of 10)								
R4, R5, R11, R16, R17, R22, R25	10K	7	\$ 0.06	\$ 0.60			<a href="#">691104</a>					Bulk (in units of 10)								
R21	100K	1	\$ 0.06	\$ 0.60			<a href="#">691340</a>					Bulk (in units of 10)								
RP1, RP3, RP100, RP101, RP103	1K BUSSED 9 PIN	5	\$ 0.47	\$ 2.35								<a href="#">858-L0915102LF</a>								
SW1	8 Pos DIP SW	1	\$ 0.69	\$ 0.69			<a href="#">139012</a>					DIP Switch, SPST On Off, 8-POS Slide Flush PC Pins 2.54mm Through Hole								
U1	Z84C0020PEG 20 MHZ Z80	1	\$ 11.27	\$ 11.27	DIP40		<a href="#">692-Z84C0020PEG</a>													
U2	AS6C1008-55TIN	1	\$ 2.33	\$ 2.33	DIP32		<a href="#">AS6C1008-55PCN</a>													
U6, U10, U13, U17	74HCT540	4	\$ 0.61	\$ 2.44	DIP20		<a href="#">SN74HCT540N</a>					Can use 74LS or 74F parts								
U19, U9	74HCT00/74LS00	2	\$ 0.55	\$ 1.10	DIP14		<a href="#">44871</a> <a href="#">SN74HCT00N</a>					Can use 74LS or 74F parts								
U111, U609, U20	74HCT04	3	\$ 0.49	\$ 1.47	DIP14		<a href="#">44898</a> <a href="#">SN74HCT04N</a>					Can use 74LS or 74F parts								
U8	74HCT10/74LS10	1	\$ 0.58	\$ 0.58	DIP14		<a href="#">46404</a> <a href="#">CD74HC10E</a>					Can use 74LS or 74F parts								
U101	74HCT11	1	\$ 0.51	\$ 0.51	DIP14		<a href="#">46439</a> <a href="#">595-CD74HCT11E</a>					Can use 74LS or 74F parts								
U22	74HCT30/74LS30	1	\$ 0.41	\$ 0.41	DIP14		<a href="#">47458</a> <a href="#">CD74HCT30E</a>					Can use 74LS or 74F parts								
U12, U14, U21, U109	74HCT32/74LS32	4	\$ 0.59	\$ 2.36	DIP14		<a href="#">47466</a> <a href="#">SN74HCT32N</a>					Can use 74LS or 74F parts								
U18, U112, U117	74HCT74/74F74	3	\$ 0.45	\$ 1.35	DIP14		<a href="#">45137</a> <a href="#">SN74HCT74N</a>					Use only 74HCT74 or 74F74 parts.								
U15	74HCT640	1	\$ 3.43	\$ 3.43	DIP20		<a href="#">595-CD74HCT640E</a>					Can use 74LS or 74F parts								
U16	74LS148	1	\$ 1.59	\$ 1.59	DIP16		<a href="#">46682</a> <a href="#">595-SN74LS148N</a>					Can use 74LS or 74F parts								
U105	74F153	1	\$ 0.65	\$ 0.65	DIP16		<a href="#">SN74F153N</a>					Can use 74LS or 74F parts								
U106	74F161/74LS161	1	\$ 0.70	\$ 0.70	DIP16		<a href="#">46818</a> <a href="#">SN74F161AN</a>					Can use 74LS or 74F parts								
U108	74HCT273/74LS273	1	\$ 0.79	\$ 0.79	DIP20		<a href="#">47386</a> <a href="#">SN74HCT273N</a>					Can use 74LS or 74F parts								
U104	74HCT541/74LS541	1	\$ 0.95	\$ 0.95	DIP20		<a href="#">47870</a> <a href="#">SN74HCT541N</a>					Can use 74LS or 74F parts								
U118	74HCT4040	1	\$ 0.65	\$ 0.65	DIP16		<a href="#">2288151</a> <a href="#">CD74HCT4040E</a>					High Speed CMOS Logic 12-Stage Binary Counter 1 Element 12 Bit Negative Edge 16-PDIP								
U103	RTC 72421	1	\$ 6.99	\$ 6.99	DIP18		<a href="#">732-RTC-72421BR</a>													
U100	AT28C256-15PU	1	\$ 10.26	\$ 10.26	DIP40		<a href="#">556-AT28C256-15PU</a>					PAM37/MMS ROM								
U107	NC-61 (PAL)	2		\$ -	DIP20		<a href="#">2290551</a> <a href="#">ATF16V8B-15PU</a>					Program from .jed files on KOYADO.COM								
U3	TL7705	1	\$ 0.79	\$ 0.79	DIP8		<a href="#">595-TL7705ACPE4</a>													
U605, U607	75189	2	\$ 0.49	\$ 0.98	DIP14		<a href="#">23181</a>					LM1489N Line Receiver 4 Receiver 14-Pin Plastic Dip Tube (being discontinued by Jameco)								
U606, U608	75188	2	\$ 0.49	\$ 0.98	DIP14		<a href="#">23157</a>					LM1488N Line Transmitter 4 Transceiver 14-Pin Plastic Dip Tube (being discontinued by Jameco)								

U116	16.384 MHZ CLOCK OSC	1	\$ 1.29	\$ 1.29	DIP14			<a href="#">16.384MHz Full Can</a>		<a href="#">A-725</a>	16.384 MHz. These are getting hard to find - search eBay or Amazon for possible sources
U110	10.000 MHZ CLOCK OSC	1	\$ 1.75	\$ 1.75	DIP8	<a href="#">102779</a>					10MHz Half Can Oscillator TTL 30mA 6ns
U113	1.8432 MHz	0	\$ 2.49	\$ -	DIP14	<a href="#">27879</a>					Replaced by 3.6864MHz Oscillator at U4
U4	3.6864MHZ	1	\$ 2.45	\$ 2.45	DIP14	<a href="#">2299055</a>					
U25	78L12	1	\$ 0.35	\$ 0.35		<a href="#">51203</a>					
U26	79L12	1	\$ 0.39	\$ 0.39		<a href="#">51431</a>					
U24, U27	LM7805/POLULU	2	\$ 0.55	\$ 1.10		<a href="#">51262</a>	<a href="#">926-LM7805CT/NOPB</a>		<a href="#">2836</a>		Can substitute Pololu step-up/down regulator S9V11F5
JPx (16 x 2-pin)	40 pin Header	1	\$ 1.19	\$ 1.19		<a href="#">160882</a>					Use for various headers; break to correct size
JPx (14 x 3-pin)	40 pin Header	2	\$ 1.19	\$ 2.38		<a href="#">160882</a>					
BT1	CR2032	1	\$ 0.89	\$ 0.89		<a href="#">CR2032 Lithium Battery 3V 225mAh</a>					
CR2032 Battery holder		1	\$ 0.65	\$ 0.65		<a href="#">PC Mount CR2032 Coin Cell Battery Holder</a>		<a href="#">2032 holder</a>			Rechargeable battery holder
Shorting Block	2 pin	20	\$ 0.15	\$ 3.00		<a href="#">112442</a>					Socket Shorting Block Blue Closed 5mm (bulk orders of 10)
P603, P604	15 pin right angle connector	2	\$ 1.09	\$ 2.18		<a href="#">1946041</a>					Use 36 position version and cut into two 15 pin headers.
P1, P2	Bus connector	2	\$ 5.35	\$ 10.70			<a href="#">200-BCS125LSHE</a>				Bus connector
Front Panel 2MHz 2-pin Header	2-pin header	1	\$ 0.39	\$ 0.39		<a href="#">879588</a>					Front Panel 2MHZ CLK Header
2-pin housing connector	2-pin housing connector	1	\$ 0.12	\$ 0.12		<a href="#">234798</a>					
Female contact	Female contact	2	\$ 0.12	\$ 1.20		<a href="#">234931</a>					
J1	4 position friction lock header - USB VDI1	1	\$ 0.29	\$ 0.29		<a href="#">232282</a>					
P201	5 position friction lock header - H8 Front Panel	1	\$ 0.35	\$ 0.35		<a href="#">232291</a>					Front Panel support.
DUART 20-pin Header	20 pin Header	2	\$ 4.97	\$ 9.94			<a href="#">TS-120-G-A-2</a>				2.54mm Male 40 Pin Single Row Round Header Strip Gold Plated
	8 pin IC socket	2	\$ 0.45	\$ 0.90		<a href="#">51626</a>					IC Socket 8-Pin Machine Tooled Low Profile 0.3 Inch Wide
	14 pin IC socket	22	\$ 0.65	\$ 14.30		<a href="#">37197</a>					Socket IC 14 Pin Machine Tooled Low Profile 0.3 Inch Wide
	16 pin IC socket	4	\$ 0.75	\$ 3.00		<a href="#">37402</a>					Socket IC 16 Pin Machine Tooled Low Profile 0.3 Inch Wide
	18 pin IC socket	1	\$ 0.75	\$ 0.75		<a href="#">65585</a>					18-Pin Machine Tooled Low Profile IC Socket 0.3 Inch Wide
	20 pin IC socket	9	\$ 0.89	\$ 8.01		<a href="#">38623</a>					20-Pin Machine Tooled Low Profile IC Socket 0.3 Inch Wide
U100	28 pin IC socket	1	\$ 1.39	\$ 1.39		<a href="#">40329</a>					Socket IC 28 Pin Machine Tooled Low Profile Soldertail 0.6" Width
U100	28 pin low profile ZIF IC socket (optional)	1	\$ 9.95	\$ 9.95		<a href="#">102745</a>					Optional ZIF socket for easy experimental ROM swaps
U2	32 pin IC socket	1	\$ 1.25	\$ 1.25		<a href="#">105381</a>					32-Pin Machine Tooled Low Profile IC Socket 0.6 Inch Wide
U114, U1	40 pin IC socket	2	\$ 1.69	\$ 3.38		<a href="#">41136</a>					40-Pin Machine Tooled Low Profile IC Socket 0.6 Inch Wide
TOTAL				\$ 169.16							
<b>DUART piggy-back board:</b>											
J1	USB Type "A" Socket	1	\$ 0.89	\$ 0.89		<a href="#">161024</a>					
U561, U602	16C550	2	\$ 4.95	\$ 9.90	DIP40	<a href="#">288809</a>					UART 1 Channel 16 BYTE Fifo 3.3 Volt 5 Volt 40-Pin PDIP (limited stock)
U3	74HCT125/74LS125	1	\$ 0.79	\$ 0.79	DIP14	<a href="#">46501</a>					
U2	74HCT138/74LS138	1	\$ 0.79	\$ 0.79	DIP16	<a href="#">46607</a>					
U1	74HCT14/74LS14	1	\$ 0.65	\$ 0.65	DIP14	<a href="#">46640</a>					
C1, C2, C3, C4, C6, C7	0.1 uf	6	\$ 0.25	\$ 1.50		<a href="#">332672</a>					
R1, R2	330R	2	\$ 0.06	\$ 0.60		<a href="#">690742</a>					
R3, R4	10K	2	\$ 0.06	\$ 0.60		<a href="#">691104</a>					
R5, R6, R7	1K	3	\$ 0.06	\$ 0.60		<a href="#">690865</a>					
C8, C9	47 pf	2	\$ 0.15	\$ 1.50		<a href="#">15512</a>					
D1	5mm green LED	1	\$ 0.15	\$ 1.50		<a href="#">34761</a>					
D2	1N5819	1	\$ 0.35	\$ 0.35		<a href="#">177965</a>					
F1	PTC, 1.1A	1	\$ 0.33	\$ 0.33			<a href="#">530-0ZRR0110FF1A</a>				
C5	2.2 uf (Tantalum)	1	\$ 0.59	\$ 0.59		<a href="#">33736</a>					
P1	1x4 right angle friction lock header	1	\$ 0.39	\$ 0.39		<a href="#">233453</a>					
U4	VDIP1	1	\$ 26.19	\$ 26.19	DIP24		<a href="#">895-VDIP1</a>				
JP1	1x2 (cut from 40-pin header)	1	\$ 1.19	\$ 1.19		<a href="#">160882</a>					

