

## ICS64S – Commodore 64 compatible replacement motherboard

Uses most of the same components from Assembly 250407 and KU-14194HB motherboards

### STEP-BY-STEP BUILD GUIDE/LOG - PRINT THIS BOM GUIDE!

**INSERT AND SOLDER COMPONENTS IN THE ORDER SHOWN BELOW**

**CHECK OFF EACH COMPONENT WHEN DONE!**

**USE THE INTERACTIVE BOM REFERENCE HERE – [HTTP://WWW.CBMSTUFF.COM/ICS64S/ICS64S\\_IREF.HTML](http://www.cbmstuff.com/ics64s/ics64s_iref.html)**

BOARD REFERENCE	QTY	VALUE	DESCRIPTION
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#### RESISTORS

<input type="checkbox"/>	R42	1	82	82 ohm 1%
<input type="checkbox"/>	R26,R53	2	100	100 ohm 1%
<input type="checkbox"/>	R52	1	330	330 ohm 1%
<input type="checkbox"/>	R39	1	390	390 ohm 1%
<input type="checkbox"/>	R5	1	560	560 ohm 1%
<input type="checkbox"/>	R4,R6,R8,R16,R28,R29,R30,R31,R36,R38	10	1K	1K 1%
<input type="checkbox"/>	R2,R51	2	1.5K	1.5K 1%
<input type="checkbox"/>	R17,R37	2	2.7K	2.7K 1%
<input type="checkbox"/>	R1,R43,R44,R45	4	3.3K	3.3K 1%
<input type="checkbox"/>	R3,R7	2	10K	10K 1%
<input type="checkbox"/>	R19	1	15K	15K 1%
<input type="checkbox"/>	R33,R34	2	47K	47K 1%
<input type="checkbox"/>	R9	1	100K	100K 1%
<input type="checkbox"/>	R10	1	330K	330K 1%
<input type="checkbox"/>	R35,R41,R50	3	470K	470K 1%
<input type="checkbox"/>	RP1,RP2	2	33 ohm x 4	Network, 33 ohm, Isolated 8 pin SIP
<input type="checkbox"/>	RP3	1	3.3K x 7	Network, 3.3K, Bussed 8 pin SIP
<input type="checkbox"/>	RP4	1	3.3K x 9	Network, 3.3K, Bussed 10 pin SIP

#### DIODES

<input type="checkbox"/>	CR1	1	IN4371	Zener, 2.7V, 500mW, DO-35-2
<input type="checkbox"/>	CR2	1	IN755	Zener, 7.5V, 500mW, DO-35-2
<input type="checkbox"/>	CR5,CR6	2	1N4001	Rectifier, 1A, 50V
<input type="checkbox"/>	CR7,CR8,CR9,CR10	4	GPP20J	Rectifier, 2A, 600V, DO-15

#### FERRITE BEADS

<input type="checkbox"/>	FB1,FB2,FB3,FB4,FB5,FB7,FB8,FB9,FB10,FB11,FB12,FB14,FB15,FB16,FB17,FB18,FB19,FB20,FB21,FB22	20	FERRITE_BEAD	3.75x5.5mm, axial
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#### SMALL INDUCTORS

<input type="checkbox"/>	L1,L2	2	2.2uH	Inductor 2.2uH 5% axial
<input type="checkbox"/>	L5	1	4.7uH	Inductor 4.7uH 10% axial

#### SMALL CAPACITORS

<input type="checkbox"/>	*C70 (PAL)	1	15pf	MLCC 15pf 50V 5% C0G NPO
<input type="checkbox"/>	*C70 (NTSC)	1	16pf	MLCC 16pf 50V 5% C0G NPO
<input type="checkbox"/>	C36	1	20pf	MLCC 20pf 50V 5% C0G NPO
<input type="checkbox"/>	C83,C86	2	82pF	MLCC 82pf 50V 5% C0G NPO
<input type="checkbox"/>	C204	1	150pf	MLCC 150pf 50V 5% C0G NPO
<input type="checkbox"/>	C23	1	390pf	MLCC 390pf 50V 5% C0G NPO
<input type="checkbox"/>	C10,C11	2	470pf	MLCC 470pf 50V 5% C0G NPO
<input type="checkbox"/>	C37	1	1000pf	MLCC 1000pf 50V 5% C0G NPO
<input type="checkbox"/>	C48,C93	2	1800pf	MLCC 1800pf 50V 5% C0G NPO
<input type="checkbox"/>	C38	1	4700pf	MLCC 4700pf 50V 5% C0G NPO
<input type="checkbox"/>	C1,C2,C3,C4,C5,C6,C7,C9,C12,C15,C16,C18,C22,C25,C26,C27,C28,C29,C30,C31,C32,C33,C35,C39,C40,C41,C42,C43,C44,C45,C46,C47,C49,C50,C51,C52,C53,C54,C56,C58,C59,C60,C61,C63,C66,C67,C68,C74,C84,C89,C92,C95,C96,C98,C99,C101,C103,C105	58	0.1uf	Capacitor - MLCC 0.1uf 50V 10% X7R
<input type="checkbox"/>	C20,C21	2	0.22uf	Capacitor - Poly Film 0.22uf 63V 10%
<input type="checkbox"/>	C97,C100	2	0.22uf	Capacitor - MLCC 0.22uf 100V 10% X7R
<input type="checkbox"/>	C85	1	0.47uf	Capacitor- MLCC 0.47uf 50V 10% X7R
<input type="checkbox"/>	C8,C13,C14,C24,C34,C57,C62,C64,C65,C94,C102,C107,C108	13	10uf	Capacitor - Electrolytic 10uf 50V 20%

**SOCKETS / INTEGRATED CIRCUITS (CHIPS)**

<input type="checkbox"/>	U1	1	40 PIN / CIA_U1	6526 CIA
<input type="checkbox"/>	U2	1	40 PIN / CIA_U2	6526 CIA
<input type="checkbox"/>	U3	1	28 PIN / BASIC ROM	8K ROM
<input type="checkbox"/>	U4	1	28 PIN / KERNAL ROM	8K-64K ROM
<input type="checkbox"/>	U5	1	28 PIN / CHAR ROM	4K ROM
<input type="checkbox"/>	U6	1	18 PIN / VIDEO RAM	2114 SRAM
<input type="checkbox"/>	U7	1	40 PIN / CPU	6510 CPU
<input type="checkbox"/>	U9,U10,U11,U12,U21,U22,U23,U24	8	16 PIN / RAM	4164-2 1x64kb SDRAM
<input type="checkbox"/>	U17	1	28 PIN / PLA	82S100 PLA
<input type="checkbox"/>	U18	1	28 PIN / SID	6581 – original computer
<input type="checkbox"/>	U19	1	40 PIN / VICII	6567/6569 ( NTSC/PAL) VICII
<input type="checkbox"/>	U8	1	14 PIN / 7406N	IC HEX INVERTER OPEN COLLECTOR
<input type="checkbox"/>	U13,U25	1	16 PIN / 74LS257	IC QUAD 2-1 DATA SEL/MUX
<input type="checkbox"/>	U14	1	16 PIN / 74LS258	IC QUAD 2-1 MULTIPLEXER TRI S
<input type="checkbox"/>	U15	1	16 PIN / 74LS139	IC DUAL 2-4 LINE DECODER
<input type="checkbox"/>	U16,U28	2	14 PIN / CD4066	IC QUAD BILATERAL SWITCH
<input type="checkbox"/>	U20	1	14 PIN / NE556	IC OSC TIMER DUAL
<input type="checkbox"/>	U26	1	20 PIN / 74LS373	IC OCT D-TYPE LATCH
<input type="checkbox"/>	U27	1	14 PIN / 74LS08	IC GATE AND 4CH 2-INP
<input type="checkbox"/>	U29	1	14 PIN / 74LS74	IC FF D-TYPE DUAL 1BIT
<input type="checkbox"/>	U30	1	16 PIN / 74LS193	IC 4-BIT UP/DOWN COUNTER
<input type="checkbox"/>	U31	1	16 PIN / 74LS629N	IC OSC DUAL VCO 20MHZ
<input type="checkbox"/>	U32	1	14 PIN / MC4044	IC PHASE DETECTOR

**TRANSISTORS**

<input type="checkbox"/>	Q1,Q2,Q7,Q8	4	2SC1815	Bipolar Transistor TO-92 Vce=60V 400mA
<input type="checkbox"/>	Q3	1	TP298/2SD880	Bipolar Transistor TO-220

**CRYSTAL (CHOOSE ONE)**

<input type="checkbox"/>	*Y1 (NTSC)	1	Crystal	14.31818MHz 50ppm HC-49/US 18pF
<input type="checkbox"/>	*Y1 (NTSC)	1	Crystal	14.31818MHz 100ppm HC-49 18pF
<input type="checkbox"/>	*Y1 (PAL)	1	Crystal	17.734475MHz 50ppm HC-49/US 18pF
<input type="checkbox"/>	*Y1 (PAL)	1	Crystal	17.734475MHz 100ppm HC-49 18pF

**REGULATORS**

<input type="checkbox"/>	VR1	1	7812	12v regulator 1A TO-220
<input type="checkbox"/>	VR2	1	7805	5v regulator 1A TO-220

**CONNECTORS / HEADERS**

<input type="checkbox"/>	CN1	1	Header	Male vertical, 1x20, 0.100" (pull pin 2 from connector)
<input type="checkbox"/>	CN4	1	IEC port	6 pin round DIN 45322
<input type="checkbox"/>	CN5	1	Video port connector	8 pin round DIN 45326
<input type="checkbox"/>	CN6	1	Cartridge port connector	Edge connector, dual row, female, 22x2 (44 pos) 0.100"
<input type="checkbox"/>	CN7	1	Power connector	7 pin round DIN 45329
<input type="checkbox"/>	CN8,CN9	2	Joystick port connector	DB9, multiple options
<input type="checkbox"/>	CN10, J6	2	Header	Male vertical, 1x3, 0,100"
<input type="checkbox"/>	J1, INT IEC	2	Header	Male vertical, 2x3 (or two 1x3), 0.100"
<input type="checkbox"/>	J2	1	Header	Male horizontal, 1x3, 0.100"
<input type="checkbox"/>	J3,J4,J5	3	Header	Male vertical, 1x4, 0.100"

**MISCELLANEOUS**

<input type="checkbox"/>	SW1	1	POWER_SWITCH	Original computer / NEW
<input type="checkbox"/>	F1	2	Clip (half)	Eaton Fuse Clip
<input type="checkbox"/>	FUSE	1	1A	Fuse Glass 6x32mm 1A 250VAC fast blow
<input type="checkbox"/>	*L3 (optional – can use straight 18awg-22awg wire)	1	330uH	Inductor 330uH 10% axial
<input type="checkbox"/>	L4	1	CHOKE	250V,3.8mH,2.1A,150mOhms, Original computer / NEW
<input type="checkbox"/>	R27	1	500	Trimmer, 500 Ohms, Linear

**LARGE CAPACITORS**

<input type="checkbox"/>	C17 C91	2	100uf	Capacitor – Electrolytic 100uf 63V 20%
<input type="checkbox"/>	C55	1	330uf	Capacitor – Electrolytic 330uf 35V 20%
<input type="checkbox"/>	C88 C90	2	470uf	Capacitor – Electrolytic 470uf 50V 20%
<input type="checkbox"/>	C19	1	2200uf	Capacitor – Electrolytic 2200uF 25V 20%