

# Hilltopper TallBoy Transceiver with LCD Display -- Bill of Materials, Sorted by Part Value

Qty	Bag #	Reference designator	Description	Marking
<b>Capacitors</b>				
1	Bag 6	C6	10 pF C0G cap	"100"
1	Bag 5	C15	10 pF C0G cap	"100"
2	Bag 3	C40, C41	22 pF C0G cap	"220"
1	Bag 5	C16	47 pF C0G cap	"470"
3	Bag 6	C1, C8, C12	47 pF C0G cap	"470"
1	Bag 5	C17	68 pF C0G cap	"680" or "68J"
3	Bag 6	C7, C9, C11	100 pF C0G cap	"101"
1	Bag 6	C10	150 pF C0G cap	"151"
1	Bag 5	C22	220 pF C0G cap	"221"
1	Bag 5	C21	470 pF C0G cap	"471"
1	Bag 3	C24	470 pF C0G cap	"471"
1	Bag 4	C26	820 pF C0G cap	"821"
1	Bag 4	C27	.0022 $\mu$ F (2200 pF) C0G	"222"
1	Bag 5	C18	.033 $\mu$ F cap	"333"
10	Bag 2	C4, C5, C13, C14, C31, C37, C38, C39, C47, C54	.01 $\mu$ F cap	"103"
15	Bag 1	C19, C20, C23, C25, C28, C32, C33, C34, C35, C36, C42, C44, C45, C46, C48	0.1 $\mu$ F cap	"104"
1	Bag 3	C43	100 $\mu$ F electrolytic cap	note +/- polarity
2	Bag 4	C29, C30	100 $\mu$ F electrolytic cap	note +/- polarity
1	Bag 5	C53	12-60 pF trimmer cap	brown plastic body
<b>Resistors</b>				
2	Bag 4	R13, R23	4.7 ohm	Yellow-violet-gold-gold
2	Bag 3	R14, R15	470 ohm	Yellow-violet-brown-gold
1	Bag 4	R22	1.0K ohm	Brown-black-red-gold
2	Final Bag	R1, R16	5K potentiometer, PCB mount	"5K" or "502"
1	Bag 3	R18	10K ohm	Brown-black-orange-gold
1	Bag 4	R11	10K ohm	Brown-black-orange-gold
2	Bag 5	R2, R3	10K ohm	Brown-black-orange-gold
4	Bag 7	R17, R19, R20, R21	10K ohm	Brown-black-orange-gold
1	Bag 5	R9	22K ohm	Red-red-orange-gold
1	Bag 4	R8	47K ohm	Yellow-violet-orange-gold
1	Bag 4	R4	150K ohm	Brown-green-yellow-gold
1	Bag 5	R5	330K ohm	Orange-orange-yellow-gold
1	Bag 4	R10	510K ohm	Green-brown-yellow-gold
2	Bag 4	R7, R12	1.0M ohm	Brown-black-green-gold
1	Bag 5	R6	1.0M ohm	Brown-black-green-gold
<b>Inductors</b>				
2	Bag 6	L3, L4	18 $\mu$ H molded inductor, 5% or 10% tolerance	brown-grey-black-(gold or silver)
1	Band Pack	L5	FT37-43 ferrite toroid core	dark gray core, cross listed in each Band Pack
<b>Semiconductors</b>				
2	n/a	U1, U2	SA612AD mixer 8-pin SOIC-8 IC	SMD parts pre-installed on PCB
1	ESD Bag	D1	1N5818 Schottky rectifier diode	black epoxy body
4	ESD Bag	D2, D3, D4, D5	1N4148 small signal diode	glass body, small
2	ESD Bag	D6, D7	BAT85 small signal Schottky diode	glass body, small
1	ESD Bag	D8	1N4756 47 V 1 W Zener diode	glass body, larger than above
5	ESD Bag	Q1, Q3, Q5, Q6, Q7	BS170 N-channel MOSFET **static sensitive**	TO-92 black epoxy package
1	ESD Bag	Q2	J113 N-channel JFET	TO-92 black epoxy package
1	ESD Bag	Q4	FQU8P10 or IRF-9530 P-channel MOSFET **static sensitive**	FQU8P10 has small heat sink tab, IRF-9530 has normal TO-220 tab
1	ESD Bag	U3	NJM4556AD operational amplifier	8-pin DIP IC
1	ESD Bag	U4	LM78M05 linear 5V regulator	has small heat sink tab
1	ESD Bag	U5	ATmega328P **static sensitive**	28-pin DIP IC
1	ESD Bag	U6	LM78L05 linear 5V regulator	TO-92 black epoxy package
1	ESD Bag	U7	74AC08 quad AND **static sensitive**	14-pin DIP IC
1	ESD Bag	LCD1	2 row x 8 character I2C interfaced LCD display	Assembly of two small PC boards
1	ESD Bag	Clock generator	Si5351a board	with an 8-pin male header strip, see group 3.

Controls and Connectors				
1	Bag 7	J1	BNC jack, right-angle - PCB mounting	Antenna
1	Bag 3	J2	2.1 x 5.5 mm coaxial DC jack - PC mounting	DC power input
2	Bag 4	J3, J4	3.5 mm stereo jack - PC mounting	Headphones & Paddles
1	Final Bag	SW1	SPST momentary-ON pushbutton switch	FUNCTION switch
1	Final Bag	SW2	rotary encoder, with SPST pushbutton	TUNING control
1	Final Bag	--	SPST panel mount mini toggle switch	Power ON/OFF on rear panel
1	n/a	--	optional - panel mount 3.5mm stereo jack	for serial data (not supplied with kit)
Miscellaneous and Hardware				
5	XTAL Bag	X1 - X5	5.185 MHz HC-49/US crystal	matched set, BFO & IF filter
1	Bag 3	X6	16.000 MHz HC-49/US crystal	U5 microprocessor clock
3	Final Bag	--	Knob	has slotted setscrew
4	Final Bag	--	#6 standoff, 5/8" unthreaded	between top cover & PCB
4	Final Bag	--	#6 standoff, 1/4" unthreaded	between bottom cover & PCB
4	Final Bag	--	#6-32 standoff, 5/8" F-F threaded	between top cover & PCB
4	Final Bag	--	#6-32 x 5/8" machine screw, pan head	To attach bottom cover
4	Final Bag	--	#6-32 x 1" machine screw, pan head	To attach top cover
4	Final Bag	--	#4-40 x 3/8" machine screw, pan head	For LCD mounting
1	Bag 3	CAL	2-pin male right-angled header, 0.1" spacing	
1	Bag 3	CAL	2-pin female shorting jumper	
1	Bag 4	--	8-pin DIP socket	for U3 may be in ESD Bag & IC in socket
1	Bag 7	--	14-pin DIP socket	for U7 may be in ESD Bag & IC in socket
1	Bag 3	--	28-pin DIP socket	for U5 may be in ESD Bag & IC in socket
1	Bag 7	J5 Serial Programming	6-pin vertical male header strip, 0.1"	
1	Bag 7	J6 I2C bus	4-pin vertical male header strip, 0.1"	to connect to LCD display
1	Bag 7	J7	4-pin vertical male header strip, 0.1"	for future accessory
1	Final Bag	--	3D printed shaft extender for rotary encoder	for SW2 (28.5mm long)
1	Final Bag	--	3D printed shaft Extender for PB switch	for SW1
2	Final Bag	--	3D printed shaft extender for potentiometers	for R1 and R16 (29.9mm long)
2	Final Bag	--	3D printed mounting bracket for LCD display	for LCD display
1	Final Bag	--	4-conductor 10cm female-female ribbon cable	for LCD display
1	Final Bag	--	Silicone plug for 1/4" hole	for rear panel unused hole
1pc	Final Bag	--	Insulated hookup wire, 4 inches	For rear panel SPDT switch
1	Boards	--	Main Printed Circuit Board	4SQRP
1	Boards	--	Bottom cover for enclosure	Blank
1	Boards	--	Top cover for enclosure	Cutouts for controls & display
1	Boards	--	Rear panel for enclosure	Cutouts for jacks & controls
1	Boards	--	Front panel for enclosure	Blank, with tabs each end
2	Boards	--	Side panels for enclosure	Blank, with notches each end

Band-Specific Band Packs				
1	40 m Bag	L1	10 $\mu$ H molded inductor, 5% or 10% tolerance	brown-black-black-(gold or silver)
1	40 m Bag	L2	6.8 $\mu$ H molded inductor, 5% or 10% tolerance	Blue-gray-gold-(gold or silver)
2	40 m Bag	L6, L7	T37-2 iron powder toroid core (red)	see group 7 instructions
1	40 m Bag	L5	FT37-43 ferrite toroid core (dark grey)	see group 7 instructions
1	40 m Bag	C2	330 pF C0G cap	"331"
1	40 m Bag	C3	100 pF C0G cap	"101"
1	40 m Bag	C49	470 pF C0G cap	"471"
1	40 m Bag	C50	820 pF C0G cap	"821"
1	40 m Bag	C51	470 pF C0G cap	"471"
1	40 m Bag	C52	100 pF C0G cap	"101"
1 pc	40 m Bag	magnet wire	AWG 21 or AWG 22 enameled wire	used for winding L5
1 or 2 pcs	40 m Bag	magnet wire	AWG 24 enameled wire (thinner than #22)	used for winding L6 and L7
1	30 m Bag	L1	5.6 $\mu$ H molded inductor, 5% or 10% tolerance	green-blue-gold-(gold or silver)
1	30 m Bag	L2	4.7 $\mu$ H molded inductor, 5% or 10% tolerance	yellow-violet-gold-(gold or silver)
1	30 m Bag	L6	T37-6 iron powder toroid core (yellow)	See Group 7 instructions
1	30 m Bag	L7	T37-2 iron powder toroid core (red)	See Group 7 instructions
1	30 m Bag	L5	FT37-43 ferrite toroid core (dark grey)	see group 7 instructions
1	30 m Bag	C2	220 pF C0G cap	"221" or ".00022"
1	30 m Bag	C3	68 pF C0G cap	"680" or "68J"
1	30 m Bag	C49	330 pF C0G cap	"331"
1	30 m Bag	C50	680 pF C0G cap	"681"
1	30 m Bag	C51	390 pF C0G cap	"391"
1	30 m Bag	C52	68 pF C0G cap	"680" or "68J"
1 pc	30 m Bag	magnet wire	AWG 21 or AWG 22 enameled wire	used for winding L5
1 or 2 pcs	30 m Bag	magnet wire	AWG 24 enameled wire (thinner than #22)	used for winding L6 and L7
1	20 m Bag	L1	2.7 $\mu$ H molded inductor, 5% or 10% tolerance	red-violet-gold-(gold or silver)
1	20 m Bag	L2	3.3 $\mu$ H molded inductor, 5% or 10% tolerance	orange-orange-gold-(gold or silver)
2	20 m Bag	L6 & L7	T37-6 iron powder toroid cores (yellow)	See Group 7 instructions
1	20 m Bag	L5	FT37-43 ferrite toroid core (dark grey)	see group 7 instructions
1	20 m Bag	C2	150 pF C0G cap	"151"
1	20 m Bag	C3	47 pF C0G cap	"470" or "47J"
1	20 m Bag	C49	220 pF C0G cap	"221"
1	20 m Bag	C50	470 pF C0G cap	"471"
1	20 m Bag	C51	270 pF C0G cap	"271"
1	20 m Bag	C52	56 pF C0G cap	"560" or "56J"
1 pc	20 m Bag	magnet wire	AWG 21 or AWG 22 enameled wire	used for winding L5
1 or 2 pcs	20 m Bag	magnet wire	AWG 24 enameled wire (thinner than #22)	used for winding L6 and L7
1	17 m Bag	L1	1.5 $\mu$ H molded inductor, 5% or 10% tolerance	brown-green-gold-(gold or silver)
1	17 m Bag	L2	2.7 $\mu$ H molded inductor, 5% or 10% tolerance	red-violet-gold-(gold or silver)
2	17 m Bag	L6 & L7	T37-6 iron powder toroid cores (yellow)	See Group 7 instructions
1	17 m Bag	L5	FT37-43 ferrite toroid core (dark grey)	see group 7 instructions
1	17 m Bag	C2	120 pF C0G cap	"121"
1	17 m Bag	C3	39 pF C0G cap	"390" or "39J"
1	17 m Bag	C49	160 pF C0G cap	"161" may have axial leads
1	17 m Bag	C50	390 pF C0G cap	"391"
1	17 m Bag	C51	220 pF C0G cap	"221"
1	17 m Bag	C52	39 pF C0G cap	"390" or "39J"
1 pc	17 m Bag	magnet wire	AWG 21 or AWG 22 enameled wire	used for winding L5
1 or 2 pcs	17 m Bag	magnet wire	AWG 24 enameled wire (thinner than #22)	used for winding L6 and L7
1	15 m Bag	L1	1.2 $\mu$ H molded inductor, 5% or 10% tolerance	brown-red-gold-(gold or silver)
1	15 m Bag	L2	2.2 $\mu$ H molded inductor, 5% or 10% tolerance	red-red-gold-(gold or silver)
2	15 m Bag	L6 & L7	T37-6 iron powder toroid cores (yellow)	See Group 7 instructions
1	15 m Bag	L5	FT37-43 ferrite toroid core (dark grey)	see group 7 instructions
1	15 m Bag	C2	100 pF C0G cap	"101"
1	15 m Bag	C3	33 pF C0G cap	"330" or "33J"
1	15 m Bag	C49	130 pF C0G cap	"131"
1	15 m Bag	C50	360 pF C0G cap	"361"
1	15 m Bag	C51	200 pF C0G cap	"201"
1	15 m Bag	C52	36 pF C0G cap	"360" or "36J"
1 pc	15 m Bag	magnet wire	AWG 21 or AWG 22 enameled wire	used for winding L5
1 or 2 pcs	15 m Bag	magnet wire	AWG 24 enameled wire (thinner than #22)	used for winding L6 and L7