

## Hilltopper TallBoy -- Bill of Materials, Sorted by Contents of the Individual Parts Bags

### PARTS BAG 1

Qty.	Reference designator	Description	Markings, Comments
15	C19, C20, C23, C25, C28, C32, C33, C34, C35, C36, C42, C44, C45, C46, C48	0.1 $\mu$ F ceramic capacitors	"104"

### PARTS BAG 2

Qty.	Reference designator	Description	Markings, Comments
10	C4, C5, C13, C14, C31, C37, C38, C39, C47, C54	.01 $\mu$ F ceramic capacitors	"103"

### PARTS BAG 3

Qty.	Reference designator	Description	Markings, Comments
2	C40, C41	22 pF C0G capacitor	"220"
1	C24	470 pF C0G capacitor	"471"
1	C43	100 $\mu$ F electrolytic capacitor	note +/- polarity
2	R14, R15	470 ohm	Yellow-violet-brown-gold
1	R18	10 K ohm	Brown-black-orange-gold
1	J2	2.1 x 5.5 mm coaxial DC jack - PC mounting	DC power input jack
1	X6	16.000 MHz HC-49/US crystal	U5 microprocessor clock
1	CAL	2-pin male right-angled header, 0.1" spacing	For the CAL header
1	CAL	2-pin female shorting jumper	Shorting jumper for CAL
1	--	28-pin DIP socket	for U5, may be in ESD Bag, with IC already in the socket

### PARTS BAG 4

Qty.	Reference designator	Description	Markings, Comments
1	C26	820 pF C0G capacitor	"821"
1	C27	.0022 $\mu$ F (2200 pF) C0G capacitor	"222"
2	C29, C30	100 $\mu$ F electrolytic capacitor	note +/- polarity
2	R13, R23	4.7 ohm	Yellow-violet-gold-gold
1	R22	1.0 K ohm	Brown-black-red-gold
1	R11	10 K ohm	Brown-black-orange-gold
1	R8	47 K ohm	Yellow-violet-orange-gold
1	R4	150 K ohm	Brown-green-yellow-gold
1	R10	510 K ohm	Green-brown-yellow-gold
2	R7, R12	1.0 M ohm	Brown-black-green-gold
2	J3, J4	3.5 mm stereo jack - PC mounting	Headphones & Paddles
1	--	8-pin DIP socket	for U3, may be in ESD Bag with IC already in the socket

**PARTS BAG 5**

Qty.	Reference designator	Description	Markings, Comments
1	C15	10 pF C0G capacitor	“100” or “10J”
1	C16	47 pF C0G capacitor	“470” or “47J”
1	C17	68 pF C0G capacitor	“680” or “68J”
1	C22	220 pf C0G capacitor	“221”
1	C21	470 pF C0G capacitor	“471”
1	C18	.033 µF capacitor	“333”
1	C53	12-60 pF trimmer capacitor	brown plastic body
2	R2, R3	10 K ohm	Brown-black-orange-gold
1	R9	22 K ohm	Red-red-orange-gold
1	R5	330 K ohm	Orange-orange-yellow-gold
1	R6	1.0 M ohm	Brown-black-green-gold

**PARTS BAG 6**

Qty.	Reference designator	Description	Markings, Comments
1	C6	10 pF C0G capacitor	“100” or “10J”
3	C1, C8, C12	47 pF C0G capacitor	“470” or “47J”
3	C7, C9, C11	100 pF C0G capacitor	“101”
1	C10	150 pF C0G capacitor	“151”
2	L3, L4	18 µH molded inductor	brown-grey-black - gold or silver

**PARTS BAG 7**

Qty.	Reference designator	Description	Markings, Comments
4	R17, R19, R20, R21	10K ohm	Brown-black-orange-gold
1	J1	BNC jack, right-angle - PCB mounting	Antenna
1	--	14-pin DIP socket	for U7, may be in ESD Bag with IC already in the socket
1	J5 Serial Programming	6-pin vertical male header strip, 0.1”	
1	J6 I2C bus	4-pin vertical male header strip, 0.1”	to connect to LCD display
1	J7	4-pin vertical male header strip, 0.1”	for future accessory

**CRYSTAL BAG**

Qty.	Reference designator	Description	Markings, Comments
5	X1 - X5	5.185 MHz HC-49/US crystal	5.185, matched set, For BFO & IF filter

**PC BOARD SECTIONS**

Qty.	Reference designator	Description	Markings, Comments
1	--	Main Printed Circuit Board	4SQRP 3/6/18
1	--	Bottom cover for enclosure	Bottom Cover
1	--	Top cover for enclosure	Top Cover for 8x2 LCD Display
1	--	Rear panel for enclosure	Tall Rear Panel
1	--	Front panel for enclosure	Tall Front Panel
2	--	Side panels for enclosure	Tall Side Panel

### Anti-static (ESD) Bag

Qty.	Reference designator	Description	Markings, Comments
1	D1	1N5818 Schottky rectifier diode	black epoxy body
4	D2, D3, D4, D5	1N4148 small signal diode	glass body, small
2	D6, D7	BAT85 small signal Schottky diode	glass body, small
1	D8	1N4756 47 V 1 W Zener diode	glass body, larger than above
5	Q1, Q3, Q5, Q6, Q7	BS170 N-channel MOSFET **static sensitive**	TO-92 black epoxy package
1	Q2	J113 N-channel JFET	TO-92 black epoxy package
1	Q4	FQU8P10 or IRF9530 P-channel MOSFET **static sensitive**	FQU8P10 has small heat sink tab, IRF9530 has normal TO-220 tab
1	U3	NJM4556AD operational amplifier	8-pin DIP IC
1	U4	LM78M05 linear 5V regulator	has small heat sink tab
1	U5	ATmega328P **static sensitive**	28-pin DIP IC
1	U6	LM78L05 linear 5V regulator	TO-92 black epoxy package
1	U7	74AC08 quad AND **static sensitive**	14-pin DIP IC
1	LCD1	2 row x 8 character I2C interfaced LCD display	Assembly of two small PC boards
1	Clock generator	Si5351a board	with an 8-pin male header strip -- see group 3.

### FINAL ASSEMBLY BAG

Qty.	Reference designator	Description	Markings, Comments
2	R1, R16	5 K potentiometer, PCB mount	"5K" or "502"
1	SW1	SPST momentary-ON pushbutton switch	FUNCTION switch
1	SW2	rotary encoder, with SPST pushbutton	TUNING control
1	--	SPST panel mount mini toggle switch	Rear panel power ON/OFF/ON
1 pc	--	Insulated hookup wire, 4 inches	for toggle switch
3	--	Knob	has slotted setscrew
4	--	#6 standoff, 5/8" unthreaded	between top cover & PCB
4	--	#6 standoff, 1/4" unthreaded	between bottom cover & PCB
4	--	#6-32 standoff, 5/8" F-F threaded	between top cover & PCB
4	--	#6-32 x 5/8" machine screw, Phillips pan head	To attach bottom cover
4	--	#6-32 x 1" machine screw, Phillips pan head	To attach top cover
4	--	#4-40 x 3/8" machine screw, Phillips pan head	For LCD mounting
1	--	3D printed shaft extender for rotary encoder	for SW2 (28.5mm long)
1	--	3D printed shaft Extender for PB switch	for SW1
2	--	3D printed shaft extender for potentiometers	for R1 and R16 (29.9mm long)
2	--	3D printed mounting bracket for LCD display	for LCD display
1	--	4-conductor 10 cm female-female ribbon cable	for LCD display
1	--	Silicone rubber plug for 1/4" hole	for rear panel unused hole

### MISCELLANEOUS

Qty.	Reference designator	Description	Markings, Comments
2	U1, U2	SA612AD mixer 8-pin SOIC-8 IC	SMD parts pre-installed on PCB
1	--	optional - panel mount 3.5mm stereo jack	for serial data (not supplied with kit)

## Band-Specific Band Packs – One Band Pack is Supplied with Each Kit, for the Band Chosen

40 meter Band Pack -- assembly steps for 40m will be highlighted in this color

Qty.	Reference designator	Description	Markings, Comments
1	L1	10 $\mu$ H molded inductor	brown-black-black - (gold or silver)
1	L2	6.8 $\mu$ H molded inductor	blue gray gold - (gold or silver)
2	L6, L7	T37-2 iron powder toroid core (red)	see group 7 instructions
1	L5	FT37-43 ferrite toroid core (dark grey)	see group 7 instructions
1	C2	330 pF C0G capacitor	"331"
1	C3	100 pF C0G capacitor	"101"
1	C49	470 pF C0G capacitor	"471"
1	C50	820 pF C0G capacitor	"821"
1	C51	470 pF C0G capacitor	"471"
1	C52	100 pF C0G capacitor	"101"
1 pc	magnet wire	AWG 21 or AWG 22 enameled wire	used for winding L5
1 or 2 pcs	magnet wire	AWG 24 enameled wire (thinner than #22)	used for winding L6 and L7

30 meter Band Pack -- assembly steps for 30m will be highlighted in this color

Qty.	Reference designator	Description	Markings, Comments
1	L1	5.6 $\mu$ H molded inductor	green-blue-gold - (gold or silver)
1	L2	4.7 $\mu$ H molded inductor	yellow-violet-gold - (gold or silver)
1	L6	T37-6 iron powder toroid core (yellow)	See Group 7 instructions
1	L7	T37-2 iron powder toroid core (red)	See Group 7 instructions
1	L5	FT37-43 ferrite toroid core (dark grey)	see group 7 instructions
1	C2	220 pf C0G capacitor	"221" or ".00022"
1	C3	68 pf C0G capacitor	"680" or "68J"
1	C49	330 pf C0G capacitor	"331"
1	C50	680 pf C0G capacitor	"681"
1	C51	390 pf C0G capacitor	"391"
1	C52	68 pf C0G capacitor	"680" or "68J"
1 pc	magnet wire	AWG 21 or AWG 22 enameled wire	used for winding L5
1 or 2 pcs	magnet wire	AWG 24 enameled wire (thinner than #22)	used for winding L6 and L7

20 meter Band Pack -- assembly steps for 20m will be highlighted in this color

Qty.	Reference designator	Description	Markings, Comments
1	L1	2.7 $\mu$ H molded inductor	red-violet-gold - (gold or silver)
1	L2	3.3 $\mu$ H molded inductor	orange-orange-gold -(gold or silver)
2	L6 & L7	T37-6 iron powder toroid cores (yellow)	See Group 7 instructions
1	L5	FT37-43 ferrite toroid core (dark grey)	see group 7 instructions
1	C2	150 pF C0G capacitor	"151"
1	C3	47 pF C0G capacitor	"470" or "47J"
1	C49	220 pF C0G capacitor	"221"
1	C50	470 pF C0G capacitor	"471"
1	C51	270 pF C0G capacitor	"271"
1	C52	56 pF C0G capacitor	"560" or "56J"
1 pc	magnet wire	AWG 21 or AWG 22 enameled wire	used for winding L5
1 or 2 pcs	magnet wire	AWG 24 enameled wire (thinner than #22)	used for winding L6 and L7

17 meter Band Pack -- assembly steps for 17m will be highlighted in this color

Qty.	Reference designator	Description	Markings, Comments

1	L1	1.5 $\mu$ H molded inductor	brown-green-gold - (gold or silver)
1	L2	2.7 $\mu$ H molded inductor	red-violet-gold - (gold or silver)
2	L6 & L7	T37-6 iron powder toroid cores (yellow)	See Group 7 instructions
1	L5	FT37-43 ferrite toroid core (dark grey)	see group 7 instructions
1	C2	120 pF C0G capacitor	"121"
1	C3	39 pF C0G capacitor	"390" or "39J"
1	C49	160 pF C0G capacitor	"161" may have axial leads
1	C50	390 pF C0G capacitor	"391"
1	C51	220 pF C0G capacitor	"221"
1	C52	39 pF C0G capacitor	"390" or "39J"
1 c	magnet wire	AWG 21 or AWG 22 enameled wire	used for winding L5
1 or 2 pcs	magnet wire	AWG 24 enameled wire (thinner than #22)	used for winding L6 and L7

15 meter Band Pack -- assembly steps for 15m will be highlighted in this color

Qty.	Reference designator	Description	Markings, Comments
1	L1	1.2 $\mu$ H molded inductor	brown-red-gold - (gold or silver)
1	L2	2.2 $\mu$ H molded inductor	red-red-gold - (gold or silver)
2	L6 & L7	T37-6 iron powder toroid cores (yellow)	See Group 7 instructions
1	L5	FT37-43 ferrite toroid core (dark grey)	see group 7 instructions
1	C2	100 pF C0G capacitor	"101"
1	C3	33 pF C0G capacitor	"330" or "33J"
1	C49	130 pF C0G capacitor	"131"
1	C50	360 pF C0G capacitor	"361"
1	C51	200 pF C0G capacitor	"201"
1	C52	36 pF C0G capacitor	"360" or "36J"
1 pc	magnet wire	AWG 21 or AWG 22 enameled wire	used for winding L5
1 or 2 pcs	magnet wire	AWG 24 enameled wire (thinner than #22)	used for winding L6 and L7