

HANDS-ON RADIO PARTS LIST (Thanks, John AF4WM and Steve AD7KR)

Updated through Experiment 129

Quantities assume all parts available for re-use

	MAX QTY	EXPERIMENT	NOTES
1/4 WATT RESISTOR (All values are ohms)			
10	2	2,13,15,16,46	
27, non-inductive	1	21	
39	2	13	
47	1	10	
51	1	13,26,71	
68	2	45	
75	2	13	
100	several	2,13,15,16,24,29,37,46, 48,74,77,99,100,103	Special batch requirements for experiment 100
150, non-inductive	1	21	
220	1	48,77	
220, non-inductive, such as carbon comp	2	81	Added in second set of experiments (62-121)
270	1	1,28,45,71,76	
300	1	79	Added in second set of experiments (62-121)
330	1	6,28,29,38	
390	1	48	
470	7	8,28,29,37,69,77	
510	1	9,55	
910	1	71	Added in second set of experiments (62-121)
		2,3,8,12,28,29,31,33,36,37,39, 40,55,73,77,80,101,109,111,1	
1k	10	21,125	
1.2k	1	2	
1.5k	1	1, 28,77,93	
2.2k	2	4,8,11,14,77,78	Added 1 ea in second set of experiments (62-121)
2.7k	1	27	
3.3k	1	93	Added in second set of experiments (62-121)
3.9k	1	3,6	
4.7k	2	5,8,9,45,54,68,77,93,97,109	
5.1k	1	6	
6.8k	1	1,28,55,77	
		2,3,4,7,17,18,30,31,40,41,46,5	
10k	4	4,69,73,99,109,125	
11k	1	109	Added in second set of experiments (62-121)
15k	1	2	
16k	4	42	
22k	1	2,4,11,41,45	
27k	1	11,99	
39k	1	1,5,28,41,77,93	
47k	1	4,31,103	
56k	1	41	

62k	1	5	
75k	1	41	
91k	1	5	
100k	2	99,125	Added in second set of experiments (62-121)
120k	1	39	
220k	1	11	
270k	1	38	
330k	1	97	Added in second set of experiments (62-121)
470k	1	31	
680k	1	38	
1M	several	43,55,99,125	
4.7M	1	97	Added in second set of experiments (62-121)
POWER RESISTORS (All values are ohms)			
1, 5W	1	123	Added in third set of experiments (122-181)
5, 5W	1	24	Resistors with larger power dissipations can be used
50, 10W	2	9(2)	Also OK to combine smaller units in series or parallel
100, 1/2 W	4	129	Components for experiment 129 not included in parts kit
100, 1W	1	10,32	
2.2 to 10, depends on installation preferences	2	129	Components for experiment 129 not included in parts kit
POTENTIOMETER (All values are ohms)			
100	1	28,42	
50 to 100, depends on installation preferences	1	129	Components for experiment 129 not included in parts kit
1k	1	3,4,14	
5k, panel-mount	1	78	Added in second set of experiments (62-121)
5k, PCB mount	1	109	Added in second set of experiments (62-121), Bourns series
10k	2	3,8,11,12,14,54,55,68,69,80	Added 1 ea in second set of experiments (62-121)
20k	1	9	
50k	1	10,103	
100k	1	1,2,38,41,92	
1M	1	17,39,40,109	
CAPACITORS			
50 to 200 pF, fixed-value or air-variable	1	21,43	
500 pF variable	1	102	Maximum value not critical
2.7 pF, ceramic	1	43	
68 pF, silver mica	2	71	Added in second set of experiments (62-121)
100 pF, polystyrene or ceramic	2	45,46,97	Added 1 ea in second set of experiments (62-121)
200 pF, polystyrene or silver mica	1	43,46	
220 pF, silver mica	1	71	Added in second set of experiments (62-121)
270 pF, film or ceramic	1	97	Added in second set of experiments (62-121)
390 pF, polystyrene or silver mica	2	46	
470 pF, silver mica	1	79	Added in second set of experiments (62-121)
470 pF, film or ceramic	1	97	Added in second set of experiments (62-121)

1 nF, 50V ceramic	3	17,37,74,93,103,121	
1.2 nF (1200 pF), silver mica	1	79	Added in second set of experiments (62-121)
1.5 nF, film or ceramic	1	18	
2.7 nF, film or ceramic	1	4	
5.6 nF, film or ceramic	1	4	
		5,25,42,45,46,71,93,109,121,1	
10 nF, film or ceramic	4	25	
16 nF, film or ceramic	2	41	
22 nF, film or ceramic	1	68	Added in second set of experiments (62-121)
33 nF, film or ceramic	2	4	
56 nF, film or ceramic	1	4	
		8,12,17,24,26,27,38,39,40,43,	
0.1 uF, 50 V ceramic	6	68,69,71,99,121	Added 2 ea in second set of experiments (62-121)
1 uF, 25 V electrolytic	4	7,40,69,93,121,125	
1 uF, 35 V tantalum	1	6,8	
10 uF, 25 V electrolytic	3	1,2,3,4,5,7,17,28,31,68,77	
33 uF, 25 V electrolytic	1	109	Added in second set of experiments (62-121)
47 uF, 15 V tantalum	1	15,16	Changed from 100 uF in original article
100 uF, 35 V electrolytic	2	10,15,16,30,31	Exp 15/16 input capacitor changed to electrolytic
4700 uF, 15V electrolytic	2	10,38	

INDUCTORS & CORES

2 uH	1	43	Handwound, 8 turns, 1-1/2" dia, 1" long
100 uH, 1 amp	1	15,16,118	Added in second set of experiments (62-121)
22 uH	1	46	Should be rated for 50 mA, large chokes OK
1 mH	1	26,74	
FT37-43 (ferrite) or equivalent	1	45	
FT240-61 (ferrite) or equivalent	1	48	FT240 balun kit from Amidon Associates is equivalent source
T50-6 (powdered iron) or equivalent	1	46	Original shopping list had FT50-6
T30-10 (powdered iron) or equivalent	2	71	Added in second set of experiments (62-121)
Ferrite snap-on split core	1	103	Radioshack 273-105 or type #31 or #43 mix
T-157-2 (powdered iron) or equivalent	1	103	Added in second set of experiments (62-121)

TRANSFORMERS

115 V Pri, 12.6 V Sec, RadioShack 273-1365 or similar	1	10, 33
1000 ohm - 8 ohm audio transformer, RadioShack 273-1380	1	33

TRANSISTORS

		1,2,19,20,25,28,31,40,45,46,7
2N3904	2	7
2N3906	1	19,25,40,109
2N4401	1	8
2N4416	1	43
2N7000	1	39,40

J310 or MPF102 JFET	2	99	Added in second set of experiments (62-121)
TIP31	1	9,80	
TIP42	1	38	
IRF510 MOSFET	1	9,12,15,16	
SCR, 100 V, 8 A - Digi-Key MCR218-004OS-ND	1	10	Original RadioShack part number no longer available

DIODES & RECTIFIERS

1N34	1	76,102,103	Added in second set of experiments (62-121)
1N4001	1	71,76,77,109,121	Added in second set of experiments (62-121)
		6,7,14,25,26,30,39,40,42,54,5	
1N4148	12	5,76,97,125	Added 8 ea in second set of experiments (62-121)
1N4732A	1	76	Added in second set of experiments (62-121)
1N4733A	1	6,38	
1N5234B	1	109	Added in second set of experiments (62-121)
1N5817	1	76	Added in second set of experiments (62-121)
1N5819	1	15,16	

INTEGRATED CIRCUITS

78L-05, -08, -12, or -15 voltage regulator	1	25	
4N35 Optocoupler	1	14	
741 op amp	2	3,4,8,17,19,42,54,55,73	
555 timer	2	5,69,93	
565 Phase-Locked Loop	1	68	Added in second set of experiments (62-121)
LM317 op amp	1	8,71	
LM311 Comparator	1	11,38	
LM324 quad op amp	1	17	
LM393 dual comparator	1	109	Added in second set of experiments (62-121)
CD4013 dual-D-type flip-flop	1	101	Added in second set of experiments (62-121)
CD4027 dual JK-type flip-flop	1	97	Added in second set of experiments (62-121)
CD4028 BCD-to-Decimal Decoder	1	37	
CD4029 Up/Down Counter	1	36	
CD4511 BCD-to-7-Segment Decoder	1	37	
74HC4001 Quad NOR gate	1	97	Added in second set of experiments (62-121)
74HC4040 12-stage ripple counter	1	97	Added in second set of experiments (62-121)
74HC14 hex inverter Schmitt trigger	1	125	Added in third set of experiments (122-)
74HC86 quad XOR Schmitt trigger	1	125	Added in third set of experiments (122-)

LIGHTS & DISPLAYS

Bulb, 12 V RadioShack 900-2665 or similar	1	10	
LED, Red RadioShack 276-026 or similar	5	11,36,39,40,93,101,109	
LED, Green RadioShack 276-022 or similar	1	39	
7-Seg Display, Common-Cathode, Jameco 17187 or equiv.	1	37	

MISCELLANEOUS

40-meter crystal in HC-8 or HC-16 holder	1	46	7030-7045 kHz recommended
#12 AWG solid, bare wire	6 feet	96	Added in second set of experiments (62-121), use scrap ho
#14 AWG solid, enameled wire	14 feet	48	FT240 balun kit from Amidon Associates is equivalent sourc
#20 or #22 AWG solid wire	16 feet	21,71,79,102	Total wire length for #46 & #46 & #71 (6' beyond anthology I
#24 to #28 AWG solid wire	3 feet	45,46,47	Total wire length for #46 & #46, use scrap for #47
PL-259 connector	2	116	Added in second set of experiments (62-121)
SO-239 connector	1	21, 48	
UHF double-male adapter	1	21	
UHF tee connector	1	103,116	Added in second set of experiments (62-121)
Plastic film can or pill bottle	1	22	
SPST or SPDT switch	1	22, 129	Components for experiment 129 not included in parts kit
SPST momentary NO pushbutton	1	109,125	Added in second set of experiments (62-121), Omron 6mm
RG-58 coaxial cable	25 feet	22,111,116	
RG-59 coaxial cable	20 feet	81	Added in second set of experiments (62-121)
Wooden spring-loaded clothespins		23	
Scraps of 2x4 wood		23	
Thick cardboard		23	
1/4-inch diameter dowel		23	
Glue		23	
Wood screws		23	
#6-32 machine screws		23	
#6-32 nuts		23	
#6 flat washers		23	
DPST switch	2	30	
TO-220 heat sink	1	24	
Mounting hardware for TO-220 heatsink	1 set	24	
1.5 V AAA or 9 V battery	1	32	
Terminal strip, 3 terminals plus ground	1	71	Added in second set of experiments (62-121)
Crimp-on ring terminals, #10 holes, 16-14 AWG wire	2	116	Added in second set of experiments (62-121)
PC board scrap	1	70,71	Added in second set of experiments (62-121)
5A inline fuse and holder	1	71	Added in second set of experiments (62-121)
Mechanical quadrature encoder	1	101	Added in second set of experiments (62-121), Bourns PEC1
Microammeter	1	102,103	Added in second set of experiments (62-121), 50 to 250 uA
SPST Relay, 12 V coil	1	109	Added in second set of experiments (62-121), Potter & Brun
V8ZA05P 6V MOV	1	121	Added in second set of experiments (62-121)
1.5KE8.2CA 8.2V bipolar TVS	1	121	Added in second set of experiments (62-121)
Communications speaker, 4-32 ohms	1	129	Components for experiment 129 not included in parts kit

TEST EQUIPMENT ITEMS

1/8" stereo phone plug	1	64
1/8" Mono phone plug-to-stereo phone jack adapter	1	64
3' male-to-male stereo audio jumper cable	1	64
1/8" stereo headphone splitter	1	64