



# SERVICE MANUAL

## MODEL "ROYAL 755"

### TRANSISTOR PORTABLE RADIO

#### CHASSIS 8CT41 & 8CT41Z2

#### GENERAL

These transistor portable chassis are conventional superheterodyne receivers with a tuned R.F. amplifier. They use an individual mixer and oscillator to produce the 455 Kc intermediate frequency. Chassis 8CT41 and 8CT41Z2 are virtually identical except for different transistors and a few other parts. The parts marked by asterisks on the chassis wiring and component drawing apply only to chassis 8CT41. The first and second intermediate frequency amplifiers are conventional. A (103-19) is used as the diode detector and AVC voltage source. This is then followed by a driver stage and a class "B" push-pull output stage. As you can see from the chart, the chassis uses a pair of matched transistors in the final output stage and therefore should one transistor fail, both transistors must be replaced simultaneously as chances are they will not perform properly unless so matched.

Power Supply.... Six Zenith type Z-7 1 1/2 volt batteries or six type "C" 1 1/2 volt dry cells  
Frequency Range..... 540 to 1600 KC  
Intermediate Frequency ..... 455 KC  
Sensitivity ..... Approximately 50 microvolts/meter for 50 milliwatts output  
Power Output Undistorted ..... 275 milliwatts  
Power Output Maximum ..... 400 milliwatts  
Speaker ..... 4 inch P.M.  
Alnico V Voice Coil Impedance 3.2 ohms at 400 cycles  
Accessory Earphone ..... B39-24 impedance 15 ohms at 1000 cycles

#### PRINTED CIRCUIT SERVICING

Servicing printed circuit sets is, in general, much the same as servicing ordinary receivers. However, certain tools and techniques are well suited for this type of work. The following items are especially useful:

1. Good pair of long-nose pliers.
2. Sharp wire cutters.
3. Small stiff glue brush (for solder removal).
4. Pencil type soldering iron with a small tip (25 watts or less).

**WARNING:** Excessive heat may damage the printed circuit during component replacement if a soldering pencil, iron or gun of higher wattage rating is used.

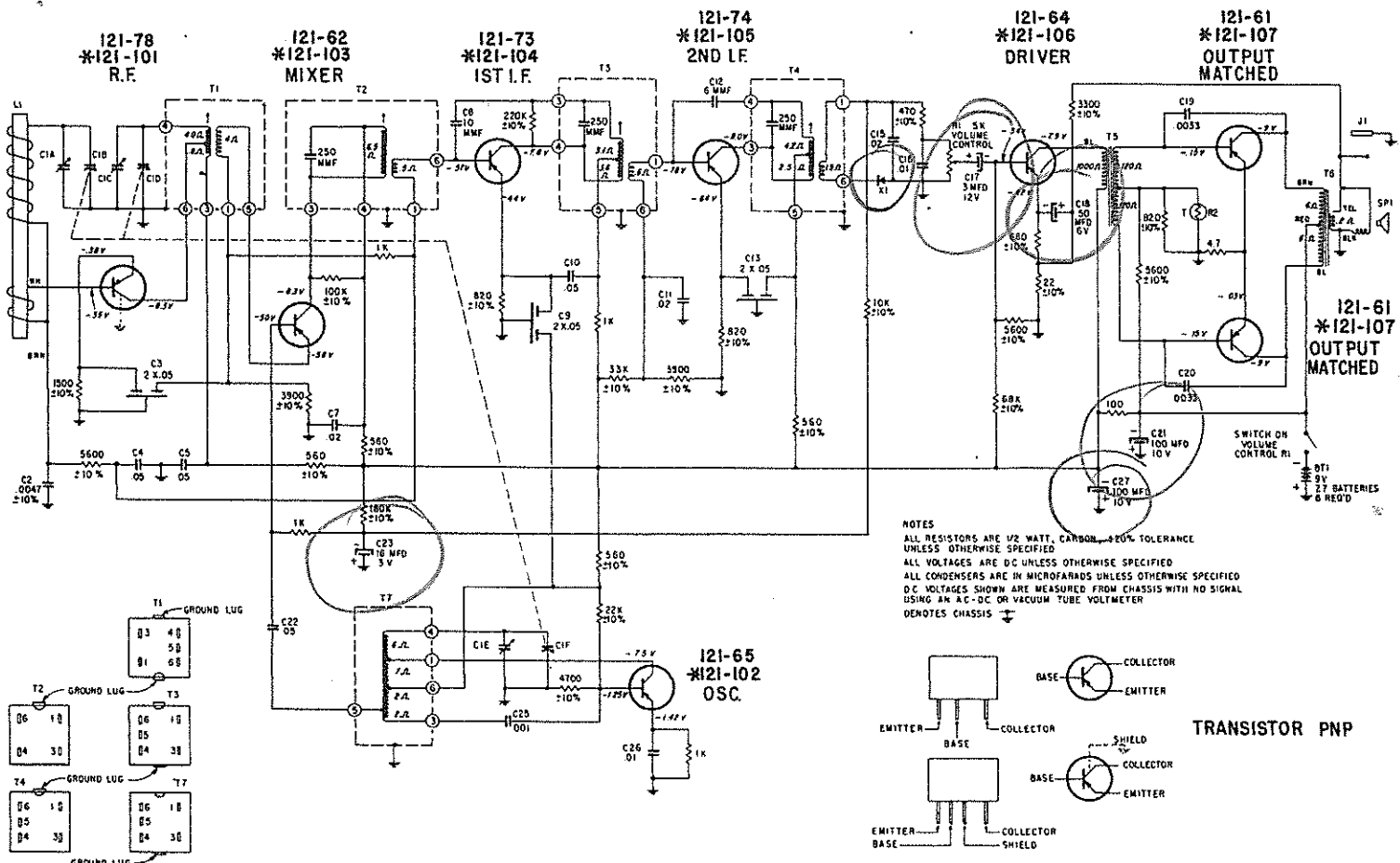
5. Tin leads on component before soldering.
6. Use only solder with a 63% tin 37% lead mixture, which has an extremely low melting point.
7. Metal pick (soldering aid).

#### COMPONENT REPLACEMENT

Resistors and capacitors should be replaced by clipping out the defective part and neatly soldering in the new part. If a unit, such as the oscillator coil or I.F. transformer, is to be removed heat the mounting lugs with a pencil type soldering iron and move them away from the soldered connection with a long-nose pliers or metal pick. Continue heating the lugs and brush away the molten solder with a small stiff glue brush. Remove the defective unit by lifting it off the chassis. Before inserting the new unit, be certain that the lug holes are open and free from solder. Forcing a lug against a solder filled lug hole may break the bond between the chassis base and the printed wiring. It is, therefore, necessary to exercise care when replacing units.

An open or damaged section of printed circuit wiring can be replaced by soldering a short jumper wire across the points to be connected.





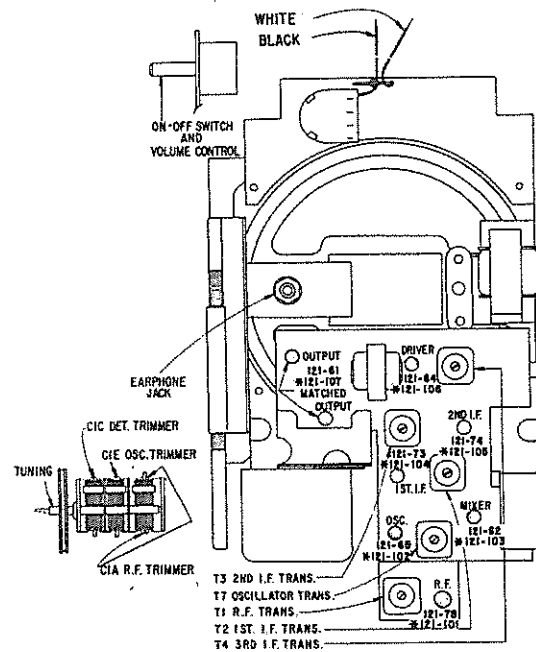
### SCHMATIC DIAGRAM FOR 8CT41 & 8CT41Z2

#### ALIGNMENT PROCEDURE

Operation	Input Signal Frequency	Connect Inner Conductor From Oscillator To	Connect Outer Shield Conductor From Oscillator To	Set Dial At	Trimmers	Purpose
1	455 KC	ONE TURN LOOSELY COUPLED TO WAVEMAGNET	Chassis	600 KC	Adj. T2, T3, T4 for maximum output.	For I.F. Alignment
2	1620 KC		—	Gang wide open	C1E	Set oscillator to dial scale.
3	600 KC		—	Set dial near 600 KC	Adjust slug in T7	Adjust T7 for maximum output while rocking gang. Tune T7 for maximum output regardless of dial accuracy.
4	REPEAT STEPS 2 & 3		—	—	—	—
5	1260 KC		—	—	1260 KC	C1A, C1C

#### CHASSIS INFORMATION CHART

Chassis	Chassis Color Dot	Transistor Layout Label Color	Part No.	R.F.	Mixer	Osc.	1st I.F.	2nd I.F.	Crystal Diode Detector	Driver	Output-Output	Supplier
*8CT41	Red	Black 102-6298	Zenith E.I.A. Type	121-101 2N544 PNP	121-103 2N411 PNP	121-102 2N409 PNP	121-104 2N409 PNP	121-105 2N409 PNP	103-19 1N87G	121-106 2N407 PNP	121-107 Matched Pair PNP	Sylvania
8CT41Z2	Black	Red 102-6265	Zenith E.I.A. Type	121-78 2N544 PNP	121-62 2N411 PNP	121-65 2N409 PNP	121-73 2N409 PNP	121-74 2N409 PNP	103-19 1N87G	121-64 2N407 PNP	121-61 2N407 Matched Pair PNP	R.C.A.



TRANSISTOR & TRIMMER LAYOUT

CHASSIS PARTS  
Chassis 8CT41 & 8CT41Z2

PART NO.	DIA. NO.	DESCRIPTION	PRICE
12-2506		Chassis support bracket	.10
or 12-2884 12-2507		Chassis support bracket Transformer mtg. bracket (pt. of 49-910)	.10
22-3		.01 mfd. ceramic disc - 500V	.30
22-11		.0033 mfd. ceramic disc - 1KV (2 used)	.25
22-14		.0047 mfd. ceramic disc - 500V	.25
22-2381		6 mmf. ceramic disc - 500V	.25
22-2726		30 mfd. electrolytic - 6V	1.50
22-2729		.001 mfd. ceramic disc - 25V	.25
22-2731		10 mmf. ceramic disc - 500V	.25
22-2871		16 mfd. electrolytic - 3V	1.50
22-2884		3 mfd. electrolytic - 12V	1.50
22-2885		.02 mfd. ceramic disc - 25V (3 used)	.45
22-3010		.01 mfd. ceramic disc - 25V	.45
22-3023		100 mfd. electrolytic - 10V (2 used)	1.50
22-3034		.05 mfd. ceramic disc - 25V (4 used)	.50
22-3198		2 x .05 mfd. ceramic disc - 25V (3 used)	.50
22-3208		3 section variable	6.00
24-890		Battery cover	.25
44-34		Miniature jack	.90
49-910		4" PM speaker	
54-347		6 - 32 "KEPS" nut (used on 114-49)	.05
54-417		1/4 - 32 x 3/8 hex. nut (2 used)	.10
54-421		Socket retaining nut	.03
59-356		Dial pointer	.60
61-216		Pointer guide pulley	.15
63-1715		22 ohm 1/2W ins. 10%	.17
63-1744		100 ohm 1/2W ins. 20%	.17
63-1771		470 ohm 1/2W ins. 10%	.17
63-1775		560 ohm 1/2W ins. 10% (4 used)	.17
63-1778		680 ohm 1/2W ins. 10%	.17
63-1782		920 ohm 1/2W ins. 10% (3 used)	.17
63-1786		1000 ohm 1/2W ins. 20% (4 used)	.17
63-1792		1500 ohm 1/2W ins. 10%	.17
63-1806		3300 ohm 1/2W ins. 10%	.17
63-1810		3900 ohm 1/2W ins. 10% (2 used)	.17
63-1813		4700 ohm 1/2W ins. 10%	.17
63-1817		5600 ohm 1/2W ins. 10% (4 used)	.17
63-1827		10 K ohm 1/2W ins. 10%	.17
63-1841		22 K ohm 1/2W ins. 10%	.17
63-1848		33 K ohm 1/2W ins. 10%	.17
63-1862		68 K ohm 1/2W ins. 10%	.17
63-1869		100 K ohm 1/2W ins. 10%	.17
63-1880		180 K ohm 1/2W ins. 10%	.17
63-1883		220 K ohm 1/2W ins. 10%	.17
63-3663		Thermistor	1.10
63-4530		4 - 7 ohm 1/2W ins. 20%	.17
63-4645		Vol. control & sw.	2.05
63-4646		Vol. control & sw.	
78-1067		3 contact socket (7 used)	.30
78-1096		4 contact socket	.35
90-1332		Drive cord tension spring	
90-1339		Tension spring	
94-295		Spacer bushing (use on 114-49)	.05
95-1586		3rd I.F. transformer	3.50
95-1588		Audio output transformer	4.25
95-1594		1st I.F. transformer	3.50
95-1595		2nd I.F. transformer	3.50
95-1597		Osc. transformer	2.00
95-1598		Driver transformer	5.00
95-1702		R.F. transformer	
103-19		Crystal Diode	
113-10		6 - 32 x 3/16 x 1/4 hex. hd. mach. screw - lockwasher alt. (2 used on 22-3208)	.03
114-26		8 - 18 x 1/4 x 1/4 hex. hd. self tap screw (2 used)	.03
114-78		8-18 x 5/16 x 1/4 hex. hd. self tap screw (3 used)	.03
114-49		6-32 x 5/8 x 1/4 hex. hd. mach. screw	
114-180		6-20 x 1/4 x 1/4 hex. hd. self tap screw	.03
114-614		8-18 x 1/4 hex. washer hd. self tap screw (2 used on S-47735)	.04
114-710		6-20 x 1/2 x 1/4 hex. hd. self tap screw (used on S-47737)	

CHASSIS PARTS  
Chassis 8CT41 & 8CT41Z2

PART NO.	DIA. NO.	DESCRIPTION	PRICE
125-47		Rubber grommet (used on 114-49)	.03
S-43010		Contact spring & strip assem.	.75
S-47699		Antenna	
S-47733		Vol. control mtg. bracket	
S-47735		Chassis mounting bracket	
S-47737		Strip & pulley assem.	
S-47742		Drive cord & eyelet assem.	
CABINET PARTS			
Model Royal 755 L			
PART NO.	DIA. NO.	DESCRIPTION	PRICE
Z-7		Type C dry cell - 1 1/2V (use 6)	
14-2851		Portable cabinet (leather)	
16-1661		Packing carton	
19-332		"U" clip	.05
19-356		Clip (6 used)	.05
26-655		Dial scale	1.50
54-345		1/4 - 32 x 3/8 hex. nut	.03
54-450		Thread forming palnut (6 used)	.03
57-2445		Emblem plate	.40
57-2586		Reinforcing plate	.05
57-2818		Escutcheon	
80-1304		Knob ret. spring (pt. of S-47709)	.05
80-1325		Knob ret. spring (pt. of S-47708)	.05
83-2892		Chassis cover strip	.15
83-2919		Vol. control cover strip	.10
83-2955		Battery case pull out strip	.05
83-3241		Grille background strip	
83-3231		Trim strip (all transistor)	
83-3281		Grille background strip	.20
93-862		Steel washer	
112-1156		4-24 x 1/4 Phils. flat hd. self tap screw	.05
112-1165		6-20 x 5/16 Phils. pan hd. self tap screw (4 used)	.03
114-248		6-20 x 5/16 x 1/4 hex. hd. self tap screw (2 used)	.03
138-295		Cabinet grille	2.00
166-109		Rubber bumper (2 used)	.10
196-340		Speaker gasket	
202-1531		Instruction book	.15
S-42785		Battery housing	1.50
S-42991		Battery cover & spring assem.	.50
S-47708		Knob & spring assem. - tuning	
S-47709		Knob & spring assem. - Vol.	
CHASSIS PARTS Chassis 8CT41 ONLY			
PART NO.	DIA. NO.	DESCRIPTION	PRICE
12-2835		Ant. shield bracket	.20
121-101		Transistor - R.F.	3.75
121-102		Transistor - Osc.	2.50
121-103		Transistor - Mixer	2.65
121-104		Transistor - 1st I.F.	2.50
121-105		Transistor - 2nd I.F.	2.50
121-106		Transistor - Driver	1.75
121-107		Transistor - Output	2.15
CHASSIS PARTS Chassis 8CT41Z2 ONLY			
PART NO.	DIA. NO.	DESCRIPTION	PRICE
12-2836		Ant. shield bracket	.20
121-61		Transistor - Output (2 used)	4.30
121-62		Transistor - Mixer	2.65
121-64		Transistor - Driver	2.15
121-65		Transistor - Osc.	2.50
121-73		Transistor - 1st I.F.	2.50
121-74		Transistor - 2nd I.F.	2.50
121-78		Transistor - R.F.	3.80

Prices shown are suggested U.S.A. retail prices which include U.S.A. Federal Manufacturers' Excise Tax where applicable and are subject to change without notice.

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