

Model 412

Battery Operated Radio Receiver

Specifications

Frequency Range:

530 to 1750 K.C.

I.F.:

463 K.C.

Tubes:

Type	Function
1A6	1st Detector and Oscillator
1A4	I.F. Amplifier
1B5	2nd Detector; A.V.C.; and 1st A.F. Amplifier
1F4	Output

Power Supply:

“A” Battery, Eveready type A-600 air cell battery is recommended, or 2 volt storage cells such as Monarch type 2M6.

“B” Battery, for portable use two Eveready No. 472 batteries may be used. For general economy use No. 485 or No. 486 batteries. Three totalling 135 volts will give maximum output and sensitivity. Two totalling 90 volts will operate the receiver at a sacrifice of two or three to one in sensitivity.

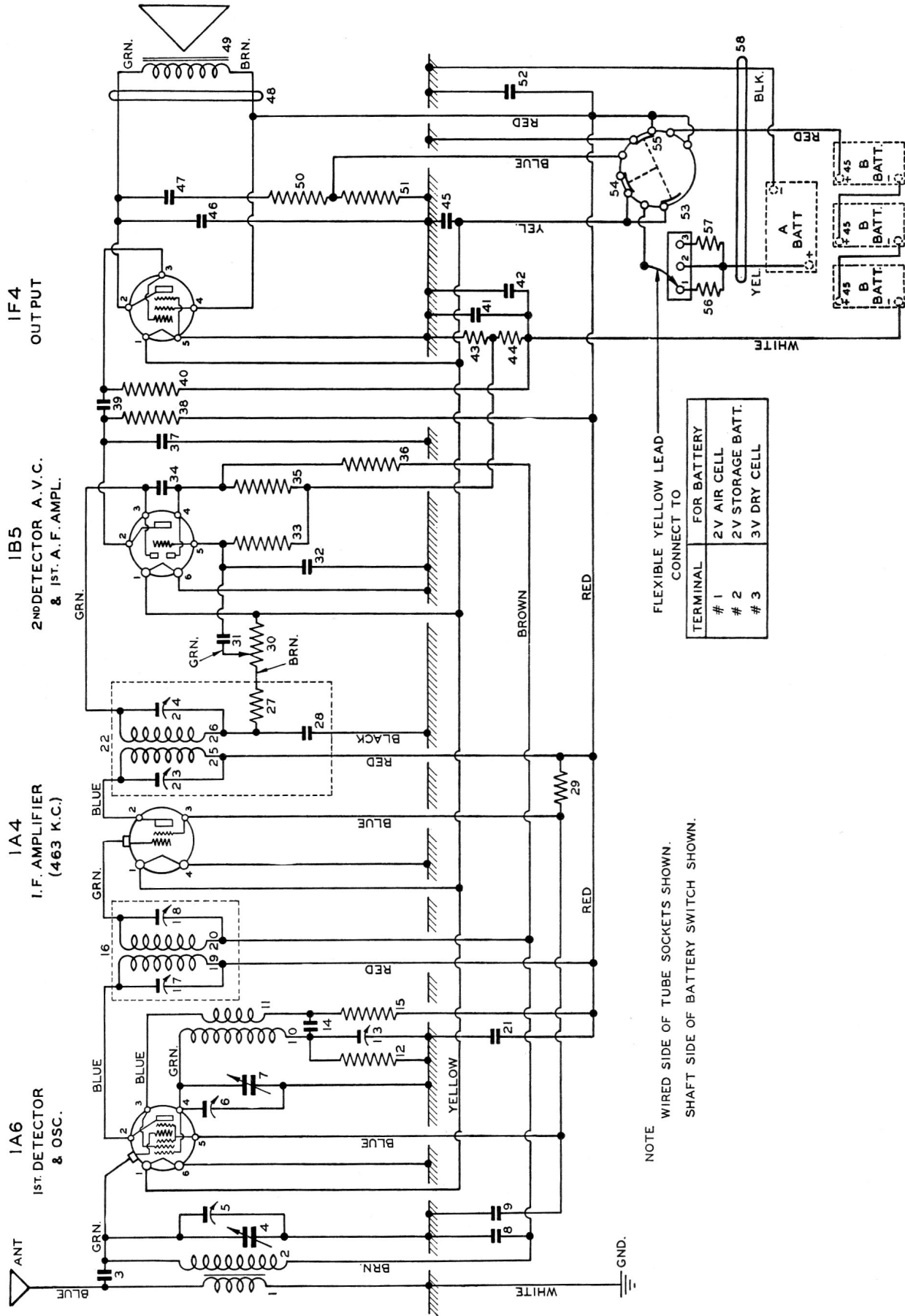
A.V.C.:

On tubes type 1A6 and 1A4, 1st Detector and I.F. Amplifier.

Controls:

Left—Volume control;
Centre—Tuning control;
Right—Battery switch and tone control.

MODEL 412 RADIO RECEIVER



NOTE WIRED SIDE OF TUBE SOCKETS SHOWN.
SHAFT SIDE OF BATTERY SWITCH SHOWN.

FLEXIBLE YELLOW LEAD
CONNECT TO

TERMINAL	FOR BATTERY
# 1	2V AIR CELL
# 2	2V STORAGE BATT.
# 3	3V DRY CELL

Schematic Diagram—Model 412 Receiver.

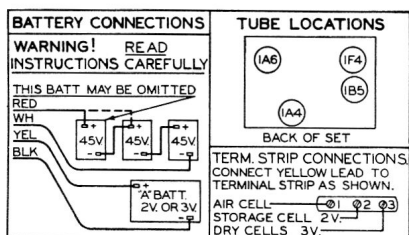
REPLACEMENT PARTS LIST

Item	Description	Part No
1	Ant. R.F. Transf. Primary....	K-2238
2	Ant. R.F. Transf. Secondary...	
3	Ant. R.F. Coupling cap.....	
4	R.F. Tuning (Two section gang).....	
5	Trimmer for R.F. (Two section gang).....	K-2250
6	Oscillator tuning (Two section gang).....	
7	Trimmer for osc. tuning (Two section gang).....	
8	Capacitor; .1 mf; 175 volt....	K-2227-9
9	Capacitor; .1 mf. 175 volt....	K-2227-9
10	Osc. coil, grid wdg.....	K-2282
11	Osc. coil, plate wdg.....	
12	Resistor; 1/10 meg. 1/2 watt...	K-2226-5
13	Trimmer (single) 300-600 mmf.	K-1314-2
14	Capacitor; 200 mmf. mica....	K-1611-3
15	Resistor; 20,000 ohms; 1/2 watt	K-2226-8
16	1st I.F. Transf. assy. (complete inc. items 17-20).....	K-2265
17	Trimmer (dual) 30-130 mmf..	K-2134-1
18	Trimmer (dual) 30-130 mmf..	
19	1st I.F. Transf. primary.....	
20	1st I.F. Transf. (coils only) secondary.....	K-2189-3
21	Capacitor; .1 mf; 175 volt....	K-2227-9
22	2 I.F. Transf. assy (complete inc. items 23-28).....	K-2266
23	Trimmer (dual) 30-130 mmf..	K-2134-1
24	Trimmer (dual) 30-130 mmf..	
25	2 I.F. Transf. primary.....	K-2189-2
26	2 I.F. Transf. (coils only) secondary.....	
27	Resistor; 50,000 ohms 1/2 watt	K-2226-6
28	Capacitor; 50 mmf; mica.....	K-1611-1
29	Resistor; 50,000 ohms; 1/2 watt	K-2226-6
30	Volume control; 1/2 meg. variable.....	K-2251
31	Capacitor; .01 mf; 175 volt....	K-2227-6
32	Capacitor; 50 mmf; mica.....	K-1611-1
33	Resistor; 2 meg.; 1/2 watt....	K-2226-1
34	Capacitor; 50 mmf; mica.....	K-1611-1

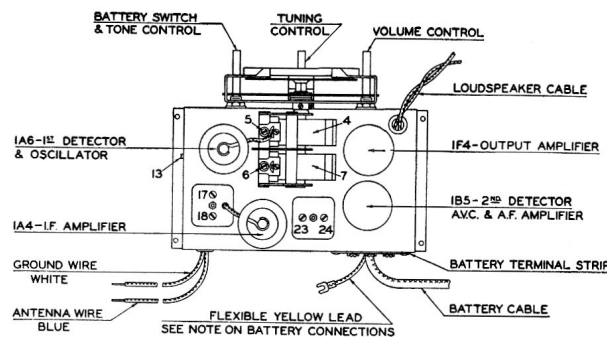
Item	Description	Part No.
35	Resistor; 1 meg; 1/2 watt....	K-2226-2
36	Resistor; 1 meg; 1/2 watt....	K-2226-2
37	Capacitor; 100 mmf; mica....	K-1611-2
38	Resistor; 1/10 meg. 1/2 watt..	K-2226-5
39	Capacitor; .01 mf; 175 volt..	K-2227-6
40	Resistor; 1 meg; 1/2 watt....	K-2226-2
41	Capacitor; .1 mf; 175 volt....	K-2227-9
42	Capacitor; (D.E.) 10 mf; 25 volt.....	K-3442-2
43	Resistor; 100 ohms; 1/2 watt..	K-2252-3
44	Resistor; 200 ohms; 1/2 watt..	K-2252-4
45	Capacitor; .5 mf; 175 volt....	K-2227-9
46	Capacitor; .001 mf; 350 volt..	K-2228-1
47	Capacitor; .02 mf; 175 volt..	K-2227-7
48	Loudspeaker cable.....	Part of item
49	Loudspeaker (mag.) imp. 400 cycles-10,000 ohms....	K-2255
50	Resistor; 5,000 ohms; 1/2 watt	K-2226-12
51	Resistor; 20,000 ohms; 1/2 watt	K-2226-8
52	Capacitor (D.E.) 4 mf; 150 volt	K-2254-2
53	A. Batt. section	Battery and tone control switch K-2241
54	Tone control section	
55	B. Batt. section	
56	Resistor; 0.90 ohm; 1/2 watt..	K-2252-1
57	Resistor; 2.7 ohms; 1/2 watt..	K-2252-2
58	Battery cable.....	K-2262

MISCELLANEOUS (Not included in item designations)

Sockets, four contact.....	K-1194-1
Sockets, six contact.....	K-1194-5
Sockets, five contact.....	K-1194-4
Tube shield bases.....	K-2390
Tube shields.....	K-2267-2
Terminal Strips (Battery).....	K-1755-1
Dial Mechanism.....	K-2248
Dial Scale (etched glass).....	K-2209
Insulation Strip Assy.....	K-2253
Knob for tuning.....	K-2231-1
Knob for volume control.....	K-2249-1
Knob for T.C. & Battery Switch...	K-2249-2
Washers for chassis mounting....	K-1206-14
Screws for chassis mounting (P.K.)	K-1032-6
Tuning Wrench.....	K-836
Escutcheon Label (Volume).....	K-2383
Escutcheon Label (Bat. & Tone)...	K-2045



Battery Connections



Chassis Layout showing Aligning Positions.

REALIGNING INSTRUCTIONS

I. F. ALIGNMENT:—

- (a) Set the generator at 463 k.c. and connect the output through an 0.1 mf. capacitor to the grid of the type 1A6 first detector tube.
- (b) Adjust trimmer 17, 18, 23 and 24 for maximum output.
- (c) Reduce the output from the signal generator to as low a value as will give an output reading, and check the adjustments. All trimmers should peak properly.

R. F. ALIGNMENT:—

- (a) Connect the signal generator to the antenna

lead through a 100 mmf. (.0001 mf.) mica capacitor.

- (b) Set the signal generator at 600 k.c. and adjust the lagging capacitor, item 13, at the same time rocking the gang back and forth until the point of maximum sensitivity is found.
- (c) Check that the indicator pointer aligns with the dial, using a 600 k.c. signal. If not, reset pointer.
- (d) Adjust set and generator to 1600 k.c. and align capacitors, items 6 and 5, for maximum output.

VOLTAGE AND CURRENT READINGS

These readings were taken on a Model 412 chassis with the gang capacitor all in and "B" battery voltage of 130 volts, and 2 volt air-cell "A" battery.

TUBE	Filament Volts	Plate Volts	Screen Volts	Grid Bias	Screen Current M.A.	Plate Current M.A.	
						Normal Bias	Bias Red. 4.5 Volts
Type 1A6 1st Det. and Osc.	2.0	130*	49	1.6**	1.2	1.9†	3.8
Type 1A4 I.F. Amplifier	2.0	130	49	1.6**†	0.30	2.0	2.8
Type 1B5 2nd Det. A.V.C. and 1st A.F. Amp.	2.0	75	...	1.6**	—	0.40	0.65
Type 1F4 Output	2.0	123	130	4.6††	2.3	7.6	12.2

*Oscillator plate voltage 95.

**Measured across resistor, item 43.

†Oscillator plate current 1.2 M.A.

††Measured across resistors, items 43 and 44.

NOTE:—Total "B" battery drain 15-17 m.a. Total "A" current drain from air-cell 290-310 m.a.