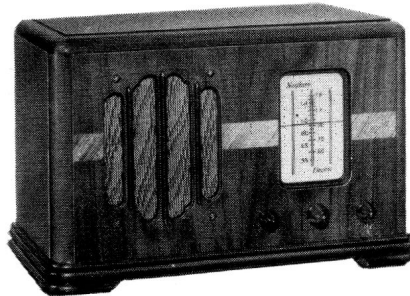


Model 432

Battery Operated Radio Receiver



MODEL 432

Specifications

Frequency Range:

535 to 1650 K.C.

I.F.:

470 K.C.

Tubes:

Type	Function
1D7G	Converter
1D5GP	I.F. Amplifier
1H6G	2nd Detector, 1st A.F. Amplifier
1F5G	Output Amplifier

Power Supply:

"A" Battery: 2 volt or 3 volt dry cells

"B" Battery: 90 volts

Controls:

Left—Battery switch and volume control.

Centre—Tuning control.

Right—Tone control.

Loudspeaker:

Six inch permanent magnet.

Cabinet:

Table cabinet.

GENERAL:—This is a battery-operated radio receiver of the superheterodyne type and employs four tubes. It is enclosed in a table cabinet and is equipped with a six-inch permanent magnet dynamic loudspeaker. The dial is of the rectangular type with the pointer moving vertically across the scale. It is calibrated in megacycles and lighted from the rear. The tuning range is 535 to 1650 kilocycles.

CIRCUIT:—(Refer to Schematic Circuit Diagram)—The antenna transformer uses inductive coupling between the primary and secondary, items 2 and 3, and capacity coupling through item 4. The gang capacitor has two sections. The first one, item 5, tunes the antenna circuit and the rear one, item 9, tunes the oscillator circuit. The parallel trimmers, items 6, 10 and 11, are mounted on the gang. The type 1D7G is used as a combined oscillator and first detector and is coupled to the type 1D5GP I.F. Amplifier by means of the double-tuned I.F. transformer, item 17. This tube is in turn coupled to the diode part of the type 1H6G, by a similar transformer, item 26. Item 33 is the diode load resistor. Full a.v.c. control is applied to the types 1D7G and 1D5GP through the a.v.c. filter which consists of items 12 and 25. Audio voltage is coupled through the capacitor, item 34, to the volume control, item 35, which is in turn coupled to the triode 1st A.F. amplifier part of the type 1H6G through the capacitor, item 36. The output of this tube is in turn resistance capacity coupled to the type 1F5G output amplifier. The tone control consists of the switch, item 41, and the capacitor, item 40. The output circuits are conventional. Bias voltages for the types 1H6G and 1F5G are obtained across the resistors, items 42 and 43, and for the types 1D7G and 1D5GP from the voltage drop across the filaments. The battery switch, item 55, is mounted on the volume control. The power supply is interrupted by opening the filament circuit. The second set of contacts shown on the schematic diagram serves to switch on and off the vibrator when this type of power supply is used. Item 47 is an electrolytic bypass capacitor across the "B" batteries which are connected to the receiver by means of the plugs, items 58 and 59, permanently wired to the battery cable, item 53, which fit into the sockets, mounted on the "B" batteries. Battery connections are indicated in Figure 3.

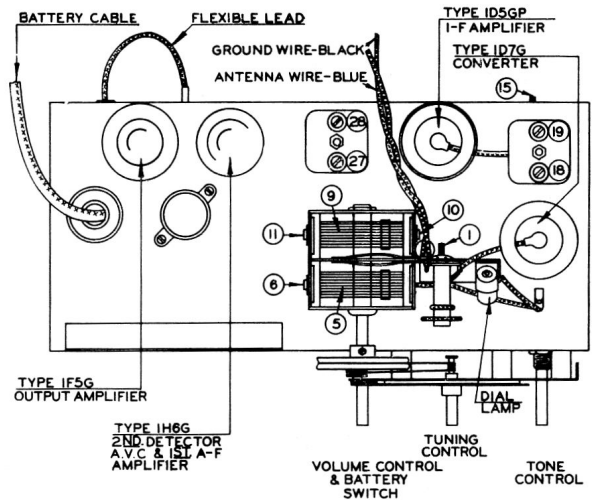


Figure 1—Chassis Layout showing Controls and Tube Positions.

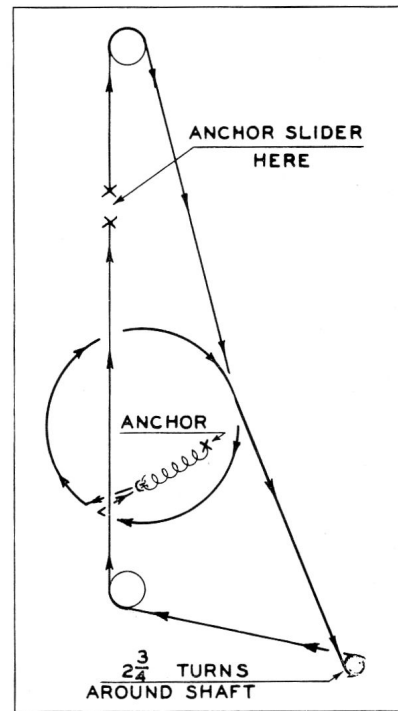


Figure 2.—Stringing Diagram

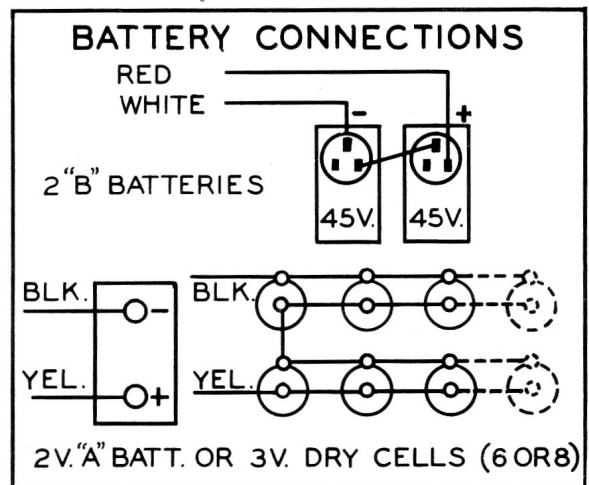


Figure 3.—Battery Connecting Diagram

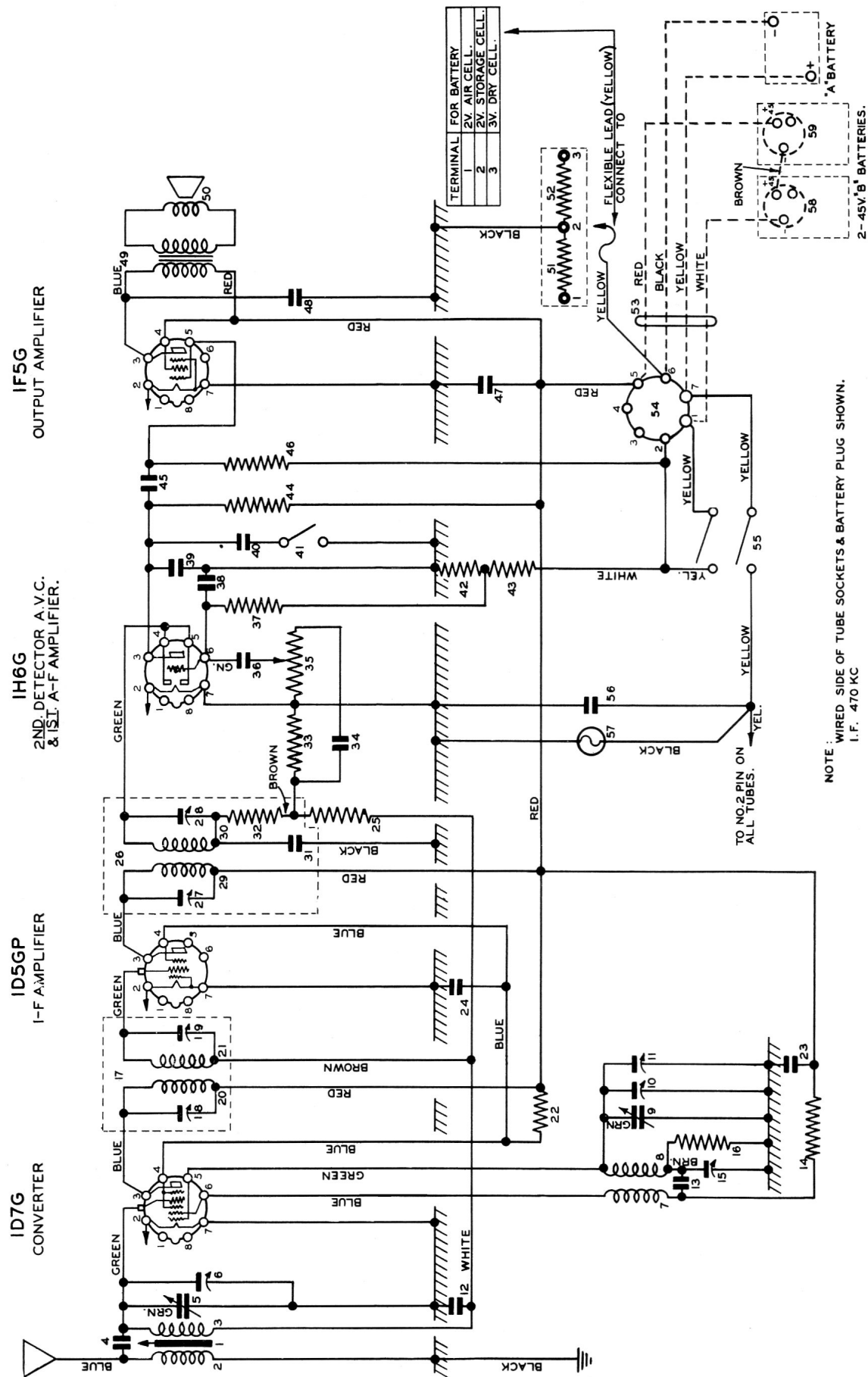


Figure 4. Schematic Circuit Diagram—432

REPLACEMENT PARTS LIST

Item	Description	Part No.
1	Iron Core.....	
2	Primary—Antenna Trans-	K-3831-2
3	former.....	
4	Coupling Capacitor—5 mmf.	
5	Gang Capacitor Section, 363	
	mmf. max. Part of	K-3974
6	Trimmer Capacitor, 2.5-20	
	mmf. Part of	K-3974
7	Osc. Coil—Plate Winding....	K-3973
8	Osc. Coil—Grid Winding....	
9	Gang Capacitor Section, 363	
	mmf. max. Part of	K-3974
10	Trimmer Capacitor, 2.5-20	
	mmf. Part of	K-3974
11	Trimmer Capacitor, 2.5-20	
	mmf. Part of	K-3974
12	Capacitor, .05 mf, 200 volts.	K-2227-8
13	Capacitor, .005 mf, 400 volts.	K-2228-5
14	Resistor, 50,000 ohms.....	K-2226-6
15	Lag Trimmer Capacitor, 485	
	mmf. K-3324-1	
16	Resistor, 50,000 ohms.....	K-2226-6
17	1st I.F. Transformer Assem-	
	bly (complete).....	K-3984
18	Trimmer Capacitor,	Part of
	30-130 mmf.	
19	Trimmer Capacitor,	K-3984
	30-130 mmf.	
20	Primary—I.F.	Part of
	Transformer.....	
21	Secondary—I.F.	K-3984
	Transformer.....	
22	Resistor, 25,000 ohms.....	K-2226-7
23	Capacitor, .1 mf, 200 volts..	K-2227-9
24	Capacitor, .05 mf, 200 volts.	K-2227-8
25	Resistor—2 megohms.....	K-2226-1
26	2nd I.F. Transformer Assem-	
	bly (complete).....	K-3986
27	Trimmer Capacitor,	Part of
	30-130 mmf.	
28	Trimmer Capacitor,	K-3986
	30-130 mmf.	
29	Primary—I.F.	Part of
	Transformer.....	
30	Secondary—I.F.	K-3986
	Transformer.....	
31	Capacitor, 100 mmf.....	Part of
32	Resistor, 50,000	K-3986
	ohms.....	
33	Resistor, .5 megohm.....	K-2226-3
34	Capacitor, .015 mf, 200 volts.	K-2227-17
35	Volume Control,	Part of
	2 megohms.....	
36	Capacitor, .015 mf, 200 volts.	K-2227-17

Item	Description	Part No.
37	Resistor, 2 megohms.....	K-2226-1
38	Capacitor, 100 mmf, mica...	K-1611-2
39	Capacitor, 100 mmf, mica...	K-1611-2
40	Capacitor, .003 mf, 400 volts.	K-2228-3
41	Tone Control Switch.....	K-3815-1
42	Resistor, 100 ohms.....	K-2226-24
43	Resistor, 500 ohms.....	K-2226-18
44	Resistor, .25 megohm.....	K-2226-4
45	Capacitor, .015 mf, 200 volts.	K-2227-17
46	Resistor, 1 megohm.....	K-2226-2
47	Electrolytic Capacitor, 10	
	mf, 150 P.V.....	K-3975
48	Capacitor, .001 mf, 400 volts.	K-2228-1
49	Output Transformer Assem-	
	bly.....	K-4046-1
50	Loudspeaker Assy (Less O.T.)	K-2960-1
51	Resistor, 0.75 ohm.....	K-2252-12
52	Resistor, 2.3 ohms.....	K-2252-11
53	Battery Cable.....	K-4005
54	Battery Receptacles.....	K-4007
	Battery Plug.....	K-4004
55	Battery Switch.....	Part of K-3762-2
56	Capacitor, .25 mf, 200 volts.	K-2227-10
57	Dial Lamp (2.0 volt).....	K-2589-1
58	"B" Battery Plug.....	K-2457
59	"B" Battery Plug.....	K-2457

MISCELLANEOUS:

Sockets.....	K-1924-1
Tube Shield Base.....	K-2390-2
Battery Terminal Strip.....	K-2763
Battery Plug.....	K-4004
Dial Frame Assy.....	K-3938
Spring (dial cord).....	K-3804
Dial Pointer.....	K-3939
Lamp Socket.....	K-3340
Dial Scale.....	K-3989
Slider.....	K-3807
Drive Assemblies.....	K-3870-2
Speaker & O.T. complete (6"	
P.M.).....	K-3982
Dial Lamp (2.0 V.).....	K-2589-1
Tube Shield.....	K-2267-2
Grid Clip.....	K-3030-2
"B" Battery Plug.....	K-2457
Clamp (Capacitor).....	K-2520-1
Cord Tip.....	K-3314
Receptacle & Cable Assy.....	K-4006
Seven prong Receptacle.....	K-4007
Knobs— $\frac{3}{4}$ dia. (Vol. & Switch)..	K-3711-3
Knobs— $\frac{7}{8}$ dia. (Tuning).....	K-3711-2
Felt Washers.....	K-2491-4
Instruction Folder (English)....	K-3979
Dial Cover.....	K-3691
Tuning Wrench.....	K-836

SOCKET VOLTAGE READINGS

These readings were taken with the gang all in and "B" battery of 90 volts. Voltage readings can be duplicated, using good voltmeters having a resistance of 1000 ohms per volt, such as the Weston Model 663 Volt-Ohmmeter or the Weston Model 772 having a resistance of 20,000 ohms per volt. Current readings can be duplicated with the Model 772 and the Model 666-1-A Socket Analyzer. When taking readings with the selector attachment connect a 0.1 mf. capacitor from the grid of the tube in the selector to ground to prevent oscillation.

TUBE TYPE AND FUNCTION	VOLTAGES					CURRENTS—MA.		
	Filament	Plate	Screen	Cathode	Grid	Screen	PLATE	
							Normal Bias	Bias red. 4½ V.
1D7G Converter	2.2	90 ①	44	—	—	1.2	.5 ②	.7
1D5GP I.F. Amplifier	2.2	90	44	—	—	.9	1.8	1.9
1H6G 2nd Detector & 1st A.F.	2.2	23	—	—	—	—	.1	.2
1F5G Output Amplifier	2.2	86	90	—	—	2.5	2.1	4.2

① Anode Grid Voltage; 45

② Anode Grid Current — .7

SOCKET RESISTANCE READINGS TO GROUND — OHMS

TYPE OF TUBE	TOP CAP (Cont. Grid)	PIN No. 1 (N.C.)	PIN No. 2 (Filament)	PIN No. 3 (Plate)	PIN No. 4 (Screen)	PIN No. 5	PIN No. 6	PIN No. 7 (Filament)	PIN No. 8 (N.C.)
1D7G	2.5 meg.	—	0 ①	12.5 ②	25,000 ②	50,000	50,000	0	—
1D5GP	2.5 meg.	—	0 ①	12.5 ②	25,000 ②	—	—	0	—
1H6G	—	—	0 ①	.25 meg. ②	.55 meg.	.55 meg.	2 meg.	0	—
1F5G	—	—	0 ①	585 ②	0 ②	1 meg.	—	0	—

① Measured to A+

② Measured to B+

All readings were taken with battery switch on but with all batteries removed.

REALIGNING INSTRUCTIONS

To secure full advantage of the performance characteristics of this receiver, any realignment necessary should be carried out carefully. A reliable test oscillator or signal generator and also a high resistance output meter should be employed.

I.F. ALIGNMENT:

- (a) Set the signal generator to 470 kc. and connect its output through a 0.1 mf. capacitor to the grid cap of the type 1D7G converter tube. Set the receiver dial at 600 kc.
- (b) Adjust trimmers, items 18, 19, 27 and 28 until maximum sensitivity is obtained.
- (c) Reduce the output from the signal generator to as low a value as will give an output reading and check the alignment of these four trimmers. All should peak properly.

R.F. ALIGNMENT:

- (a) With the gang all in, check the position of the pointer. The lower edge of the pointer should lie $1/32''$ from the lower end of the scale.
- (b) Couple the signal generator to the antenna lead (blue) through a 100 mmf. mica capacitor. Connect the ground lead (black) to ground.
- (c) Set the signal generator and receiver to 1500 kc. Adjust either of trimmers 10 or 11, or both, if necessary, to bring in the signal.
- (d) Adjust trimmer, item 6, for maximum output.
- (e) Set the generator and receiver to 600 kc. and adjust the lag trimmer capacitor, item 15, to bring in the signal.
- (f) Adjust the iron core, item 1, for maximum sensitivity.
- (g) Recheck at 1500 kc. and realign if necessary.

D.C. RESISTANCE OF COILS — OHMS

Item	Description	Resistance
2	Antenna Transformer Primary.....	23.7
3	Antenna Transformer Secondary.....	3.5
7	Oscillator Coil Plate Winding.....	2.2
8	Oscillator Coil Grid Winding.....	7.8
20	1st I.F. Transformer Primary.....	12.5
21	1st I.F. Transformer Secondary.....	12.5

Item	Description	Resistance
29	2nd I.F. Transformer Primary.....	12.5
30	2nd I.F. Transformer Secondary	12.5
49	Output Transformer Primary.....	585
	Output Transformer Secondary.....	0.18
50	Loudspeaker Voice Coil (Impedance at 400 cycles 25 ohms).....	2.1