TECHNICAL INFORMATION AND SERVICE DATA

MANUFACTURERS AWA SUPERVISED SERVICE

Radiola Transistor 7 Portable Models 897-PZ, 897-PY and 897-PX

GENERAL DESCRIPTION

Models 897-PZ, 897-PY and 897-PX are seven transistor, battery operated superheterodyne portable receivers designed for the reception of the Medium Wave Band.

Features of the design include:

Ferrite Rod Aerial with provision for external aerial; high gain I.F. transformers; Antodyne converter; ganged volume control; feedback on output stage; high sensitivity 7" x 5" elliptical speaker and economical battery operation.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

Frequency Range ..... 540-1600 Kc/s. (555-187.5 Metres)

Intermediate Frequency ..... 455 Kc/s.

Battery Complement ..... 9 Volt Battery Type 276-P

Battery Consumption ..... For zero audio output= 15 mA

Transistor Complement:

2N219	Converter
2N218	1st I.F. Amplifier
2N218	2nd I.F. Amplifier
2N408	1st Audio
2N408	Driver
2N270	Output
2N270	Output

A crystal diode GEX34 is used as the audio detector.

Loudspeaker:

7" x 5" permanent magnet No. 36457.
V.C. Impedance, 16 ohms at 400 c.p.s.

Undistorted Power Output ..... 400 mW

Controls:

Tuning Control — front left-hand of cabinet.
On/off Volume Control — right-hand end of cabinet.

Chassis Removal:

Remove the tuning and volume control knobs. These knobs are only a push on fit; however, in the case of the tuning control forcing the knob past its normal travel with a twisting action is necessary to overcome friction between the knob and the gang spindle.

Remove the two screws from the top and one screw from the bottom of the cabinet.

The chassis is now free to lift from the cabinet.

Chassis replacement is the reverse of the above. After replacing the tuning knob the pointer should be lined up on the State monograms on either side of the dial scale. Check the calibration on some known station and correct for any tracking error by forcing the knob past its free travel in the appropriate direction.

Service Notes for Transistor Receivers:

Whilst transistors, when used within the manufacturer's ratings, should give considerably longer life in service than vaccum tubes, the following precautions should be observed when servicing receivers to prevent damage to transistors.

Transistors can be damaged when checking circuit continuity by the D.C. voltage present in an ohmeter. To avoid damaging a transistor or getting a misleading resistance reading the transistors must be disconnected from the circuit.

The use of screwdrivers as a means of checking high tension, as is commonly done in mains operated receivers, is not only a waste of time but can permanently damage the transistors. Similarly, the indiscriminate shorting out of bias resistors as a means of checking whether certain stages are operating will almost certainly have drastic results, particularly in the output stages.

Transistors are extremely sensitive to heat, temperatures in excess of 90° C. can cause permanent damage. Great care should therefore be exercised when soldering transistor leads, keeping the soldering iron as far away from the transistor body as practicable and applying heat for as short a time as possible.

It should be noted that all electrolytic capacitors have their positive terminal going to earth.

Fault Finding:

The first thing to check when the receiver is inoperative, is the battery. With the receiver switched on a new battery should measure 9 volts, although a receiver will still operate satisfactorily at 6 volts.

Voltmeters used for test purposes must be at least 10,000 ohms per volt. The use of low impedance meters will only give misleading results as serious shunting effects will occur.

If the receiver is inoperative to R.F. and the converter is suspect, the oscillator can be checked by measuring the voltage between base and emitter of the converter. If the base is negative with respect to the emitter by more than 0.12 volts then the converter is not oscillating.

When checking for a circuit fault causing excessive battery drain, an overall current measurement and supplementary voltage measurements should be made. For reasons stated above continuity measurements can be misleading.

Signal tracing by injection of a signal from a signal generator is done on transistor radios in exactly the same manner as has been done for many years with conventional vacuum tube radios. The signal generator should be connected (as in past practice) in series with a capacitor to avoid shorting out bias voltages. With the transistors used in this receiver, the BASE is the signal input terminal (corresponding to the signal grid of vacuum tubes), the COLLECTOR is the signal output terminal (corresponding to plate), and the EMITTER is the common terminal (corresponding to the cathode).

The output circuit used in this receiver is of the "Class B" type; this type of output circuit has seldom been used in commercial radios for the past several years. It should therefore be noted that in "Class B" output the battery current increases greatly with increased signal input to the base.

ALIGNMENT PROCEDURE

Manufacturer's Setting of Adjustments:

The receiver is tested by the manufacturer with precision instruments and all adjusting screws are sealed. Re-alignments should be necessary only when components in tuned circuits are repaired or replaced or when it is found that the seals over the adjusting screws have been broken. It is especially important that the adjustments should not be altered unless in association with the correct testing instruments listed below.

Under no circumstances should the plates of the ganged tuning capacitor be bent, as the unit is accurately aligned during manufacture and can only be re-adjusted by skilled operators using special equipment.

For all alignment operations, keep the generator output as low as possible to avoid A.V.C. action and set the volume control in the maximum clockwise position.

Testing Instruments:

(1) A.W.A. Junior Signal Generator, type 2R7003; or

(2) A.W.A. Modulated Oscillator, series J6726.

If the modulated oscillator is used, connect a .22 megohms non-inductive resistor across the output terminals.

(3) The output impedance from collector to collector is 250 ohms. If an indication only is required then Output Meter, type 2M8832, is switched to 5,000 ohms and connected across the output collectors, should be adequate. If other types of meters are used with the correct loading, the speaker MUST BE DISCONNECTED, otherwise the maximum dissipation of the transistors will be exceeded at full audio output.

ALIGNMENT TABLE

Alignment Order	Connect "high" side of Generator to:	Tune Generator to:	Tune Receiver to:	Adjust for Maximum Peak Output:
1	Aerial Section of Gang	455 Kc/s.	Gang fully closed	Cores in T5, T4 and T3
Repeat adjustment until maximum output is obtained.				
2	Inductively coupled to Rod Aerial°	600 Kc/s.	600 Kc/s.	L.F. Osc. Core Adj. (T2)†
3	Inductively coupled to Rod Aerial°	1500 Kc/s.	1500 Kc/s.	H.F. Osc. Adj. (C5)
4	Inductively coupled to Rod Aerial°	1500 Kc/s.	1500 Kc/s.	H.F. Aerial Adj. (C1)

° A coil comprising 3 turns of 16 gauge D.C.C. wire about 12 inches in diameter should be connected between the output terminals of the test instrument, placed concentric with the rod aerial and distant not less than 1 foot from it.

† Rock the tuning control back and forth through the signal.

D.C. RESISTANCE WINDINGS

Winding	D.C. Resistance in ohms.
Ferrite Rod Assembly T1	
Primary	1
Secondary	*
Oscillator Transformer T2:	
Primary	4.2
Secondary	*
I.F. Transformer Windings T3, T4 & T5	10
1st Audio Transformer T6	
Primary	1000
Secondary	260
Driver Transformer T7:	
Primary	380
Secondary	160
Output Transformer T8:	
Primary	20
Secondary	1.7

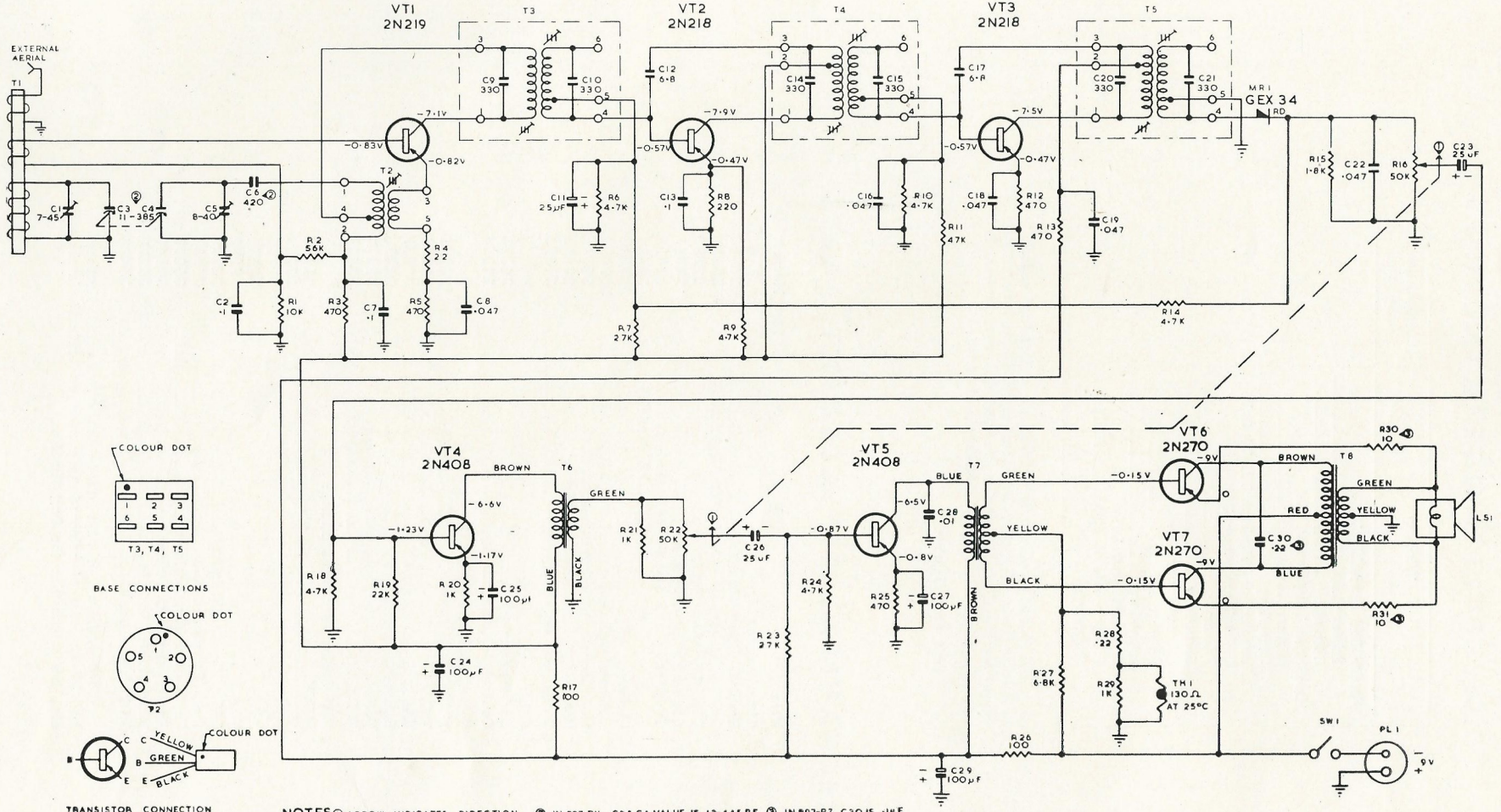
The above readings were taken on a standard chassis, but substitution of materials during manufacture may cause variations and it should not be assumed that a component is faulty if a slightly different reading is obtained.

*Less than 1 ohm.

MECHANICAL REPLACEMENT PARTS

Item	Part Number
Chassis Assembly:	
Bracket, Gang Mounting (PY Model)	36450
(PZ, PX Models)	36477
Clip, I.F. Mounting	27780
Cone Assembly, Speaker	34967
Coupling, Gang Spindle (PY Model)	36451
(PZ, PX Models)	36468
Grommet A8	389010
Grommet A2 Soft	389008
Nut, Chassis Mounting	36447
Retainer, Chassis Mounting Nut	23288
Screw, Coil Mounting	31373
Cabinet Ftting:	
Badge Assembly	36371
Cabinet	28154
Dial Scales (PY Model):	
N.S.W.	32275
VIC.	32276
QLD.	32277
S.A.	32278
W.A.	32279
TAS.	32280
Dial Scales (PZ, PX Models):	
N.S.W.	32288
VIC.	32289
QLD.	32290
S.A.	32291
W.A.	32292
TAS.	32293
Fret, Speaker	36437
Knob Assembly, Tuning	35290
Knob Assembly, Volume	31840
Name Plate, Radiola	35279
Trim Frame	36436

When ordering, always quote the above Part Numbers and in the case of coloured parts such as cabinets, knobs, etc., the colour plus the Part Number.



NOTES ① ARROW INDICATES DIRECTION OF CLOCKWISE ROTATION. ② IN 897-PY C3 & C4 VALUE IS 12-445 PF C6 IS 470 PF ③ IN 897-PZ C30 IS .1μF R30 & R31 ARE DELETED

NB: PX Model supercedes PZ Model

CIRCUIT CODE — RADIOLA 897-PZ-PY-PX

Code No.	Description	Part No.	Fig. No.	Location
	TRANSFORMERS			
T1	Ferrite Rod Aerial (PZ, PX Models)	36969	1	B10
	(PY Model)	36915		
T2	Oscillator Coil	36954	2	C1
T3	1st I.F. Transformer	36911	2	G2
T4	2nd I.F. Transformer	36913	2	J3
T5	3rd I.F. Transformer	36921	2	J6
T6	Audio Coupling Transformer	21445A	1	K15
T7	Audio Driver Transformer	21447A	1	D11
T8	Audio Output Transformer	21449A	1	B3
	RESISTORS			
	All Resistors ± 10% unless otherwise stated			
R1	10K ohms ± 5% ½ watt		2	C4
R2	56K ohms ± 5% ½ watt		2	D3
R3	470 ohms ± 5% ½ watt		2	F1
R4	22 ohms ½ watt		2	D1
R5	470 ohms ½ watt		2	E1
R6	4.7K ohms ± 5% ½ watt		2	G1
R7	27K ohms ± 5% ½ watt		2	G1
R8	220 ohms ± 5% ½ watt		2	L3
R9	4.7K ohms ± 5% ½ watt		2	K2
R10	4.7K ohms ½ watt		2	L2
R11	47K ohms ½ watt		2	L3
R12	470 ohms ½ watt		2	L4
R13	470 ohms ½ watt		2	L7
R14	4.7K ohms ½ watt		2	L5
R15	1.8K ohms ½ watt		2	K5
R16	50K ohms Volume Control	36438	1	E4
R17	100 ohms ½ watt		2	F5
R18	4.7K ohms ½ watt		2	E4
R19	22K ohms ½ watt		2	F6
R20	1K ohm ½ watt		2	G5
R21	1K ohm ½ watt		1	F5
R22	50K ohm Volume Control (ganged to R16)		1	E4
R23	27K ohms ½ watt		2	E5
R24	4.7K ohms ½ watt		2	D4
R25	470 ohms ½ watt		2	B7
R26	100 ohms ½ watt		2	M7
R27	6.8K ohms ½ watt		2	C12
R28	22 ohms ½ watt		2	C12
R29	1K ohm ½ watt		2	C13
R30	10 ohms (PX, PY Models) ½ watt		1	A7
R31	10 ohms (PX, PY Models) ½ watt		1	A7
	CAPACITORS			
C1	7-45 pF trimmer (Aerial)	31954	1	D12
C2	0.1 µF 200 volt working paper		2	B4
C3	11-385 pF tuning (Aerial) PZ, PX Models,	36466	1	D14
	12-445 pF tuning (Aerial) PY Model	36454		
C4	11-385 pF tuning (Osc.) PZ, PX models	36466	1	D14
	12-445 pF tuning (Osc.) PY Model	36454		
C5	8-40 pF spiral trimmer (Osc.)	231185	1	C13
C6	420 pF ± 2½% padder (PZ, PX Models)		2	D3
	470 pF ± 2½% padder (PY Model)			
C7	0.1 µF 200 volt working paper		2	C4
C8	0.047 µF 200 volt working paper		2	D2
C9	330 pF ± 5% silvered mica (in 1st I.F.)		2	H2
C10	330 pF ± 5% silvered mica (in 1st I.F.)		2	H1
C11	25 µF 3 volt working Electrolytic		2	J1
C12	6.8 pF ± 10% N.P.O. ceramic		2	H3
C13	0.1 µF 200 volt working paper		2	L2
C14	330 pF ± 5% silvered mica (in 2nd I.F.)		2	J3
C15	330 pF ± 5% silvered mica (in 2nd I.F.)		2	J3
C16	0.047 µF 200 volt working paper		2	L3
C17	6.8 pF ± 10% N.P.O. ceramic		2	J5
C18	0.047 µF 200 volt working paper		2	L4
C19	0.047 µF 200 volt working paper		2	M6
C20	330 pF ± 5% silvered mica (in 3rd I.F.)		2	J6
C21	330 pF ± 5% silvered mica (in 3rd I.F.)		2	J6
C22	0.047 µF 200 volt working paper		2	L5
C23	25 µF 3 volt working Electrolytic		1	D4
C24	100 µF 10 volt working Electrolytic		2	G4
C25	100 µF 10 volt working Electrolytic		2	H4
C26	25 µF 3 volt working Electrolytic		1	F4
C27	100 µF 10 volt working Electrolytic		2	C7
C28	0.01 µF 200 volt working paper		2	B7
C29	100 µF 10 volt working Electrolytic		2	M9
C30	0.1 µF 200 working paper (PZ)		2	B11
	0.22 µF 200 volt working paper (PY, PX)			
	MISCELLANEOUS			
MR1	Germanium Diode GEX 34		2	K6
TH1	Thermistor 130 ohms at 25° C.	893703	2	B13
PL1	Battery Plug	34623	1	K1
SW1	ON/OFF Switch (on R16)		1	F5
LS1	7" x 5" Loudspeaker	36457	2	G11
	TRANSISTORS			
VT1	R.C.A. 2N219		2	E2
VT2	R.C.A. 2N218		2	J2
VT3	R.C.A. 2N218		2	J5
VT4	R.C.A. 2N408		2	F6
VT5	R.C.A. 2N408		2	D6
VT6	R.C.A. 2N270		2	D14
VT7	R.C.A. 2N270		2	C9

NOTE:

PX Model supercedes PZ Model

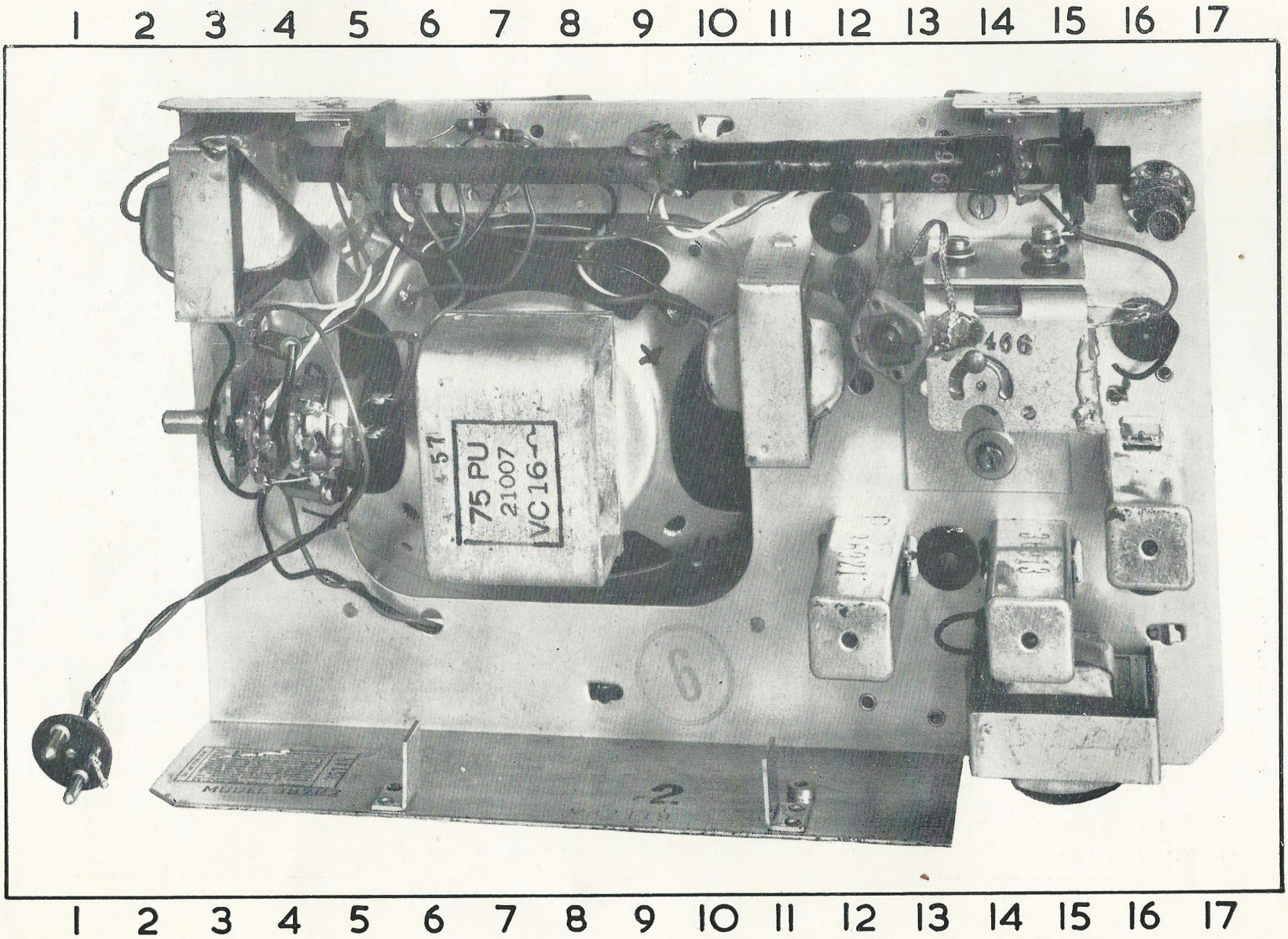

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
A B C D E F G H J K L
75 PU
21007
VC 16
466

FIG. 1

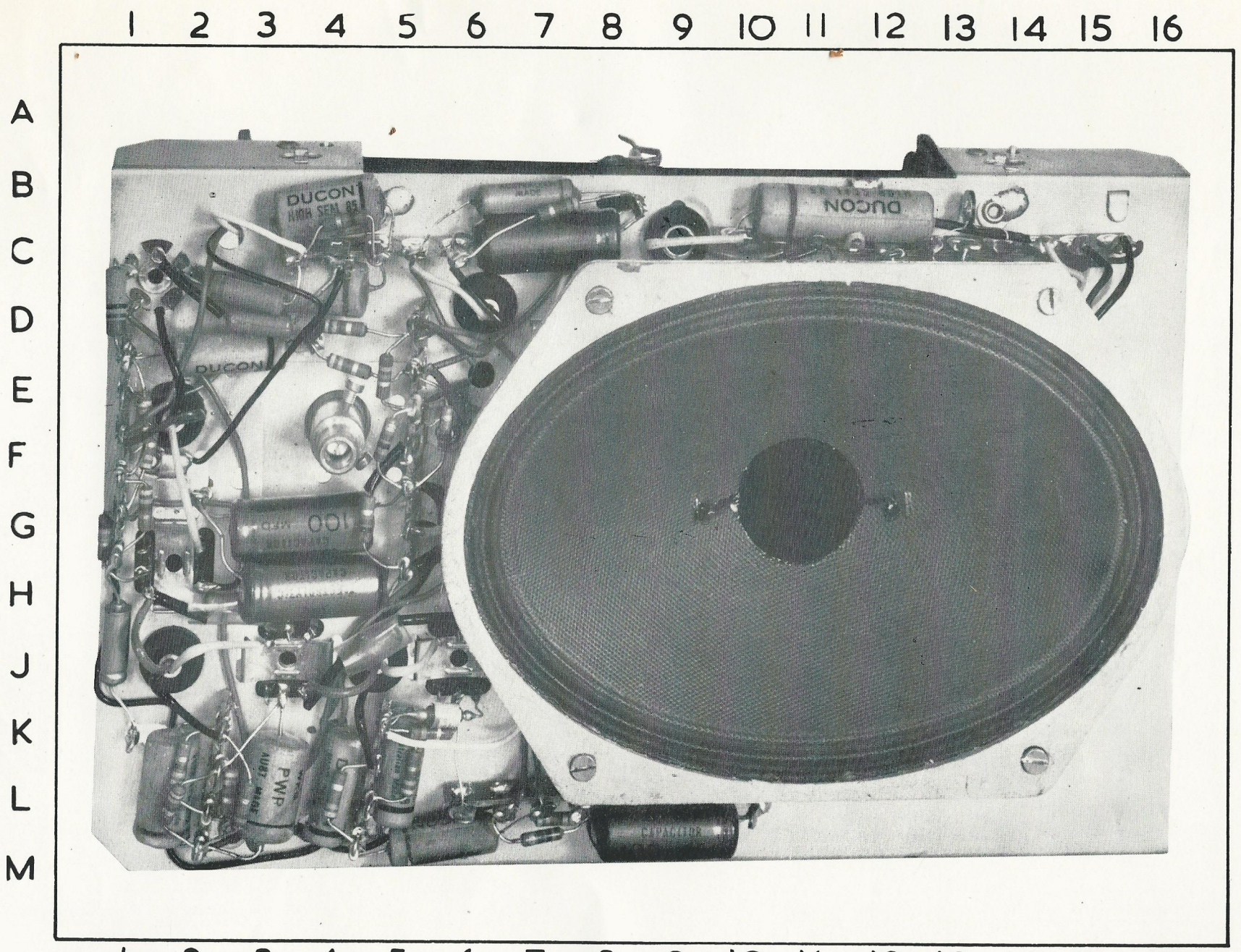

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
A B C D E F G H J K L M
DUCON
DUCON
DUCON
100
PWR

FIG. 2