

Ferguson

MODEL 344B BATTERY PORTABLE RECEIVER

SERVICE MANUAL



SPECIFICATION

Batteries

This receiver is designed for use with the following high tension and low tension dry batteries:—

	Ever-Ready	Drydex	Vidor
High Tension 90 V.	B126	526	L5512
Low Tension 1.5 V.	All-dry 35	H1184	L5040

Waveranges

Medium	-	-	182 — 557 Metres.
Long	-	-	1090—1920 Metres.

Valves

V1	DK96	Frequency Changer
V2	DF96	I.F. Amplifier
V3	DAF96	Detector and Audio Amplifier
V4	DL96	Audio Output

Loudspeaker

P.M., 5in. diameter, 3Ω speech coil.

Case Dimensions

9in. wide x 4in. high x 8½in deep.

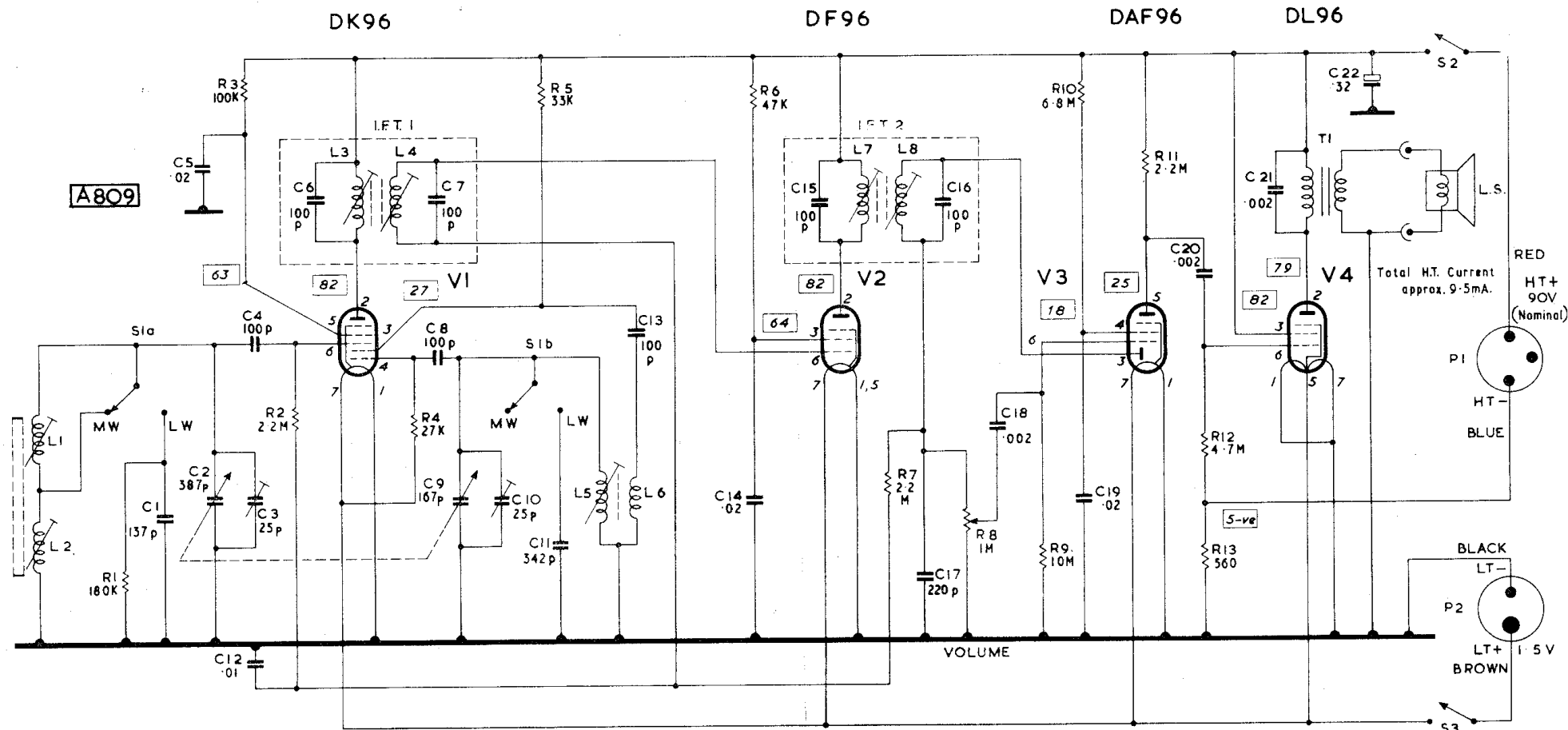


Fig. 1. Circuit diagram of model 344B. Numbers adjacent to valve electrodes denote pin connections, voltage measurements are shown in rectangles.

THE CIRCUIT

Separate L.W. and M.W. coils are provided on the ferrite-rod aerial, the long wave winding, **L1**, being short circuited by **S1A** on medium waves. The aerial circuit is tuned by **C2** with trimmer **C3** effective on M.W. On L.W., a fixed trimming capacitor **C1**, shunted by damping resistor **R1**, is switched across the circuit by **S1A**. **C4** couples the signal to the frequency changer, **V1** (DK96).

In the oscillator tuned circuit, no series padders are employed, tracking being maintained by the use of a special tuning capacitor.

The oscillator grid coil, **L5**, is tuned by

C9 and trimmer **C10** on medium waves and on long waves an additional capacitor, **C11**, is connected across the circuit by **S1B**. **V2** (DF96) functions as an I.F. amplifier and the diode section of **V3** (DAF96) as the signal detector. The volume control **R8** forms the diode load and the D.C. component of the rectified signal, decoupled by **R7** and **C12**, is applied as A.G.C. voltage to the grid circuits of **V1** and **V2**.

The pentode section of **V3** operates as an audio amplifier and is R.C. coupled to **V4** (DL96) the output valve. The grid bias voltage for **V4** is developed across **R13** in the negative return circuit of the H.T. battery.

RESISTORS

(All $\frac{1}{4}$ Watt carbon, 20% tolerance unless otherwise stated)

Ref.	Value	Rating	Function
R 1	180K Ω	10%	L.W. aerial shunt
R 2	2.2M Ω		V1 grid leak
R 3	100K Ω		V1 S.G. H.T. feed
R 4	27K Ω	10%	V1 osc. grid leak
R 5	33K Ω	10%	Oscillator H.T. feed
R 6	47K Ω		V2 S.G. H.T. feed
R 7	2.2M Ω		A.G.C. decoupling
R 8	1M Ω *	(Carbon pot. log)	Volume control
R 9	10M Ω		V3 grid leak
R10	6.8M Ω		V3 S.G. H.T. feed
R11	2.2M Ω	10%	V3 anode load
R12	4.7M Ω	10%	V4 grid leak
R13	560 Ω	5%	V4 grid bias

*Part No. Z13052

R1	C1	C11	C1
R2	A2	C12	B2
R3	A2	C13	A2
R4	A2	C14	B2
R5	A2	C15	C2
R6	B2	C16	C2
R7	C2	C17	B2
R8	A1	C18	C2
R9	C2	C19	C2
R10	C2	C20	C2
R11	C2	C21	C2
R12	C2	C22	B1
R13	C2	L1	C1
C1	C1	L2	B1
C2	B1	L3	C1
C3	B2	L4	C1
C4	A2	L5	B1
C5	A2	L6	B1
C6	A2	L7	B1
C7	A2	L8	B1
C8	A2		
C9	B1	T1	A1
C10	B2	S1A&B	C1

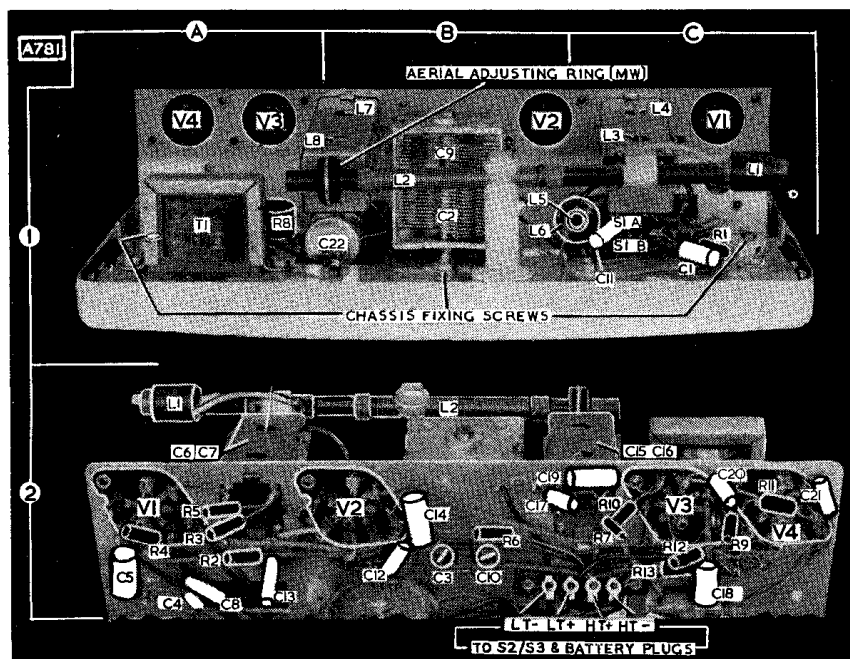


Fig. 2. Views of chassis showing component locations.

CIRCUIT ALIGNMENT

I.F. Alignment

Switch receiver to M.W., turn gang to minimum capacitance position and volume control to maximum. Inject a 470 Kc/s modulated signal through a 0.1 uF capacitor at the control grid of VI (pin 6).

Adjust L3, L4, L7 and L8 in that order for maximum output, reducing the input voltage as each circuit is brought to resonance in order to avoid A.G.C. action.

It is important that the adjustments listed above are carried out in the sequence given, otherwise, using the more conventional procedure will result in an unsatisfactory I.F. response in some receivers.

R.F. Alignment

Set the tuning gang to maximum capacitance and check that the 'gang max' marker at the edge of the scale is correctly positioned over the fixed cursor line. The dial may easily be adjusted, if necessary, after removing the tuning knob.

Sufficient signal voltage for alignment

purposes can be induced in the ferrite-rod aerial if the output lead of the signal generator is terminated in a closed loop in close proximity to the receiver. Do not make a direct connection.

The Medium waveband must be aligned first.

1. Switch to M.W. and turn the tuning knob until the calibration marker at the edge of the scale, between 200 and 300 Metres, is over the cursor line. Inject 1300 Kc/s signal and adjust C10 for maximum output.
2. Turn to the calibration marker at 500 Metres and inject 600 Kc/s signal. Adjust L5 for maximum output.
3. Repeat 1 and 2 until no further improvement can be obtained.
4. Set tuning gang to the high frequency calibration marker, inject 1300 Kc/s and adjust C3 for maximum output.
5. With tuning dial set to the 500 metre marker and with a 600 Kc/s signal,

CAPACITORS

(All 350V., 20% tolerance unless otherwise stated)

Ref.	Value	Rating	Function
C 1	137pF*	2%	L.W. fixed aerial trimmer
C 2	387pF**	(Variable)	Aerial tuning
C 3	25pF	(Trimmer)	M.W. aerial trimmer
C 4	100pF	750V.	V1 C.G. coupling
C 5	0.02uF	150V.	V1 S.G. decoupling
C 6	100pF	2%	L3 tuning
C 7	100pF	2%	L4 tuning
C 8	100pF	750V.	Osc. C.G. coupling
C 9	167pF**	(Variable)	Oscillator tuning
C10	25pF	(Trimmer)	M.W. oscillator trimmer
C11	342pF†	2%	L.W. fixed osc. trimmer
C12	0.01uF	150V.	A.G.C. decoupling
C13	100pF	750V.	Osc. feedback coupling
C14	0.02uF	150V.	V2 S.G. decoupling
C15	100pF	2%	L7 tuning
C16	100pF	2%	L8 tuning
C17	220pF	750V.	I.F. bypass
C18	0.002uF		V3 C.G. coupling
C19	0.02uF	150V.	V3 S.G. decoupling
C20	0.002uF		V4 C.G. coupling
C21	0.002uF		Tone correction
C22	32uF	Electrolytic 150V.	H.T. decoupling

*Part No. 45755

†Part No. 45754

**Swing Value Part No. Y10753

INDUCTORS AND TRANSFORMERS

(D.C. resistance not given if less than 1 ohm)

Ref.	Description and Function	Resistance	Part No.	
L1	} Ferrite-Rod Aerial	L.W. Coil	5Ω	Y10782
L2		M.W. Coil	—	
L3	} 1st I.F. Transformer	Pri.	8.5Ω	N10635
L4		Sec.	8.5Ω	
L5	Oscillator Tuning		2Ω	Y10783
L6	Oscillator Feedback		1Ω	
L7	} 2nd I.F. Transformer	Pri.	8.5Ω	N10635
L8		Sec.	8.5Ω	
T1	Output Transformer	Pri.	500Ω	Z10765
		Sec.	—	

MISCELLANEOUS

Ref.	Function and Description	Part No.
L.S.	Loudspeaker, 5in. diameter, 3Ω speech coil	Y16001/4
P1	H.T. battery plug	7554
P2	L.T. battery plug	4590/1
S1A	} Wavechange switch	Y10785
S1B		
S2	} On-Off switch	Z10791
S3		

alter the position of the adjusting ring on the ferrite-rod aerial to give maximum output.

6. Switch to L.W., inject 210 Kc/s and rotate the tuning knob until the signal is received. Adjust the position of the L.W. coil (L1) on the ferrite-rod aerial for maximum output.

VOLTAGE AND CURRENT MEASUREMENTS

The following voltage and current measurements were taken with a model 8 Avometer, voltages being measured on the 100V. range with the exception of V4 bias voltage for which the 10V. range was used.

GENERAL MEASUREMENTS

Total H.T. Current	9.5mA
H.T. Battery Voltage	87V.
H.T. Voltage (across C22)	82V.
Bias Voltage (across R13)	-5V.

VALVE MEASUREMENTS

Ref.	Valve Type	Anode		Screen	
		Volts	mA	Volts	mA
V1	DK96	82	0.5	(G4) 63 (G2) 27	* 1.5
V2	DF96	82	1	64	*
V3	DAF96	25†	*	18†	*
V4	DL96	79	5	82	0.9

*Less than 0.5mA.

†Subject to wide variations.

MECHANICAL SPARES

Part Description	Part No.
Aerial Mounting (ferrite-rod)	Y10787/1
Case (complete with handle, etc.)	N10776
Control Knobs :—	
Tuning	X10707
Tuning Spring Clip	45929
Volume and Wavechange	Y10712
Volume and Wavechange Spring Clip	Z7058
Cursor Disc	Y10702
Escutcheon	N10822
Escutcheon Decorative Ring	Z10767
Escutcheon Motif	Z10704
Escutcheon Nameplate	X10703
I.F. Transformer Clip	Z10689
Tuning Dial	Y10706
Tuning Dial Spring Clip	Z7058

The manufacturers reserve the right to vary specifications or use alternative materials as may be deemed necessary or desirable at any time.

Manufacturers

FERGUSON RADIO CORPORATION LTD.,
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ENFIELD, MIDDLESEX.

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MANCHESTER : 9 STEVENSON SQUARE.
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All Service enquiries should be addressed to the local Service Depot.