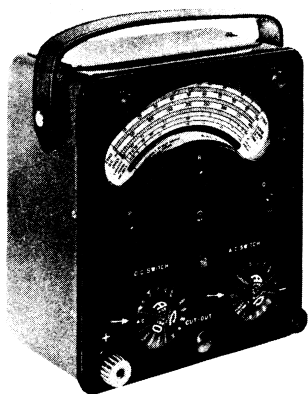




RECOMMENDED SPARES LIST

Models 7 and 7x Mk.1
and Mk. 2
Avometers

AVO LIMITED · AVOCET HOUSE · DOVER · ENGLAND

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Procedure for ordering Spare Parts

If you will kindly follow the procedure set out below, delays will not occur due to the exchange of unnecessary correspondence:

- (1) Study this manual carefully and identify the part(s) required.
- (2) State the reference number of the part(s) required, the location in the instrument and the quantity required.
- (3) State the serial number of your instrument if known. This will be found on the instrument scaleplate.

Overseas users of our instruments should send their requirements to our Representatives on their territory. If the parts are required in Great Britain, application should be made direct to Avo Limited.

Appendix to this Recommended Spares List details certain spares which are applicable only to very early models but which are still available.

ABBREVIATED SPECIFICATION

1. RANGES

Current and Voltage tests at full scale should be made on successive ranges in the following order, as far as faults present will permit:

- (a) D.C. Ranges: 2mA to 10A, 1V to 1000V including ± 2 feature on some ranges.
- (b) A.C. Ranges: 10mA to 10A, 10V to 1000V.
- (c) Resistance Ranges: Mid-scale readings on 10,000 Ω , 100,000 Ω and 1M Ω ranges.
Mid-scale readings 50 Ω , 500 Ω , 5k Ω .

2. ACCURACY

The standard required after repair calls for the following accuracies when the instrument is tested in the horizontal position:

- D.C. Current and Voltage: $\pm 1\%$ of full scale throughout.
- A.C. Current and Voltage: $\pm 2.25\%$ of full scale throughout.
- Resistance: $\pm 5\%$ of indication between 10% and 80% of scale length $\pm 10\%$ of indication at positions 10% and 90% of scale length.

3. MOVEMENT SENSITIVITY

Full scale movement current 1mA.

4. CUT-OUT OPERATION

The application of a sudden forward overload of 12:1 should cause it to trip every time, an overload of 4:1 should not.

RECOMMENDED SPARES LIST

FRONT PANEL

Item No.	Description	Circuit Ref.	Part No. 7 Mk. 2	Part No. 7X Mk.2
1.	Model Button		3258-102	3258-104
2.	Red Terminal Assembly		15536-A	15536-A
3.	Black Terminal Assembly		15536-B	15536-B
4.	Red Terminal Cap		3816-503	3816-503
5.	Black Terminal Cap		3816-502	3816-502
6.	'Q' Zero Knob		3156-510	3156-512
7.	Rev. M.C. Button		3828-304	3828-305
8.	'R' Zero Knob		3153-302	3153-303
9.	Movement Zero Adjuster (moulding & spiral)		15539-A	15539-AX
10.	Leads (mark 1) red and black (hook termination)		20913-AB	20913-AB
11.	Leads (mark 2) red and black (plug-in termination)		20913-EF	20913-EF
12.	Crocodile clips		12381-B	12381-B
13.	Old type test prod Red		45012	45012
14.	Old type test prod Black		45013	45013
15.	Pair of Long Reach Safety Clips (mark 2) in case		21509-A	21509-A
16.	Items 10, 12, 13 and 14 supplied as a set		16103-N	16103-N
17.	Items 11, 12, 13 and 14 supplied as a set		16103-P	16103-P
18.	'P' Zero Knob		3153-310	3153-701
19.	Power Factor Socket Dust Excluder		3826-702	3826-702
20.	Sealing Ring		3812-812	3812-812

CASE ASSEMBLY

Item No.	Description	Circuit Ref.	Part No. 7 Mk. 2	Part No. 7X Mk.2
1.	Complete Case Assembly		40791-C	40791-CX
2.	Case with studs, bushes, Insulation and feet.		3674-516	3674-517
3.	Case Bare		3764-524	3764-526
4.	Battery Box Assembly		40022-E	40022-F
5.	Battery Box Moulding		3881-210	3881-211
6.	Battery Contact Top		3665-111	3665-111
7.	Battery Contact Bottom		3665-101	3665-101
8.	Battery Box Cover		3518-411	3518-412
9.	Instruction Plate (English)		3271-135	3271-134
10.	Handle		3855-103	3855-103
11.	Handle Stud		3366-305	3366-305
12.	Set of Rubber Feet etc.		2/29/7	2/29/7

PANEL ASSEMBLY

Item No.	Description	Circuit Ref.	Part No. 7 Mk.2	Part No. 7X Mk.2
1.	Bottom Resistance Board Assembly		45255	45255
2.	Transformer Complete	T1	20831-A	20831-AX
*3.	3.68Ω Wound Bobbin	R18	30006-QE	30006-RF
4.	5mA Rectifier	MR1	27753-222	27753-223
5.	Surge Rectifier	MR2	12049-411	12049-540
6.	Top Resistance Board Assembly		45254	45254

* On earlier models this would be a winding on a resistor board with items 3 and 4 listed for the Top Resistance board assembly. Individual bobbins or metal film resistors are interchangeable with the original wound sections.

PANEL SUB-ASSEMBLY

Item No.	Description	Circuit Ref.	Part No. 7 Mk. 2	Part No. 7X Mk. 2
1.	Brush Arm for 'R' Control		3674-105	3674-105
2.	Contact Arm for 'R' Knob spindle		3627-103	3627-103
3.	Potentiometer Strip 'R'	RV1	11562-A	11562-A
4.	Knob Assembly Complete 'R'		15534-A	15534-AX
5.	Cut-out Fixed Contact Assembly (left hand)		16103-E	16103-E
6.	Cut-out Fixed Contact Assembly (right hand)		16103-F	16103-F
7.	Cut-out Mounting Platform		3865-109	3865-110
8.	Cut-out moving contact complete		3213-520	3213-520
9.	Cut-out Thrust rod		3216-701	3216-701
10.	Half of Switch contact assembly for d.c. ranges switch.		16103-J	16103-J
11.	Half of Switch contact assembly for d.c. ranges switch.		16103-H	16103-H
12.	Switch contact assembly for a.c. ranges switch		20840-C	20840-D
13.	Brush Arm for 'P' control		3674-706	3674-706
14.	'P' contact pillar		3374-503	3374-503
15.	Potentiometer Strip 'P'	RV3	11565-A	11565-A
16.	Knob assembly complete 'P'		15052-A	15052-AX
17.	Movement Zero Adjuster with spiral		15539-A	15539-B
18.	Cut-out Knob with sleeve and spindle and circlip		16103-AT	16103-AU
19.	Cut-out Knob return spring		3177-802	3177-802
20.	Cut-out Table Assembly		16103-G	16103-GX
21.	Wire Guide for Thrust Rod		3628-204	3628-204
22.	Cut-out crank with jewel		3116-701	3116-701
23.	Cut-out Guide Pillar Stop Spring		3171-505	3171-505
24.	Cut-out Guide Pillar		3343-108	3343-109
25.	Set of screws and Washers for cut-out table		16103-T	16103-T
26.	Lever Spring		3615-105	3615-105
27.	Lever		3558-401	3558-401
28.	Cut-out table Bare		3711-307	3711-308
29.	Brush Arm for 'Q' Control		3674-706	3674-706
30.	Spring contact 'Q'		3213-305	3213-305

PANEL SUB-ASSEMBLY (Continued)

Item No.	Description	Circuit Ref.	Part No. 7 Mk. 2	Part No. 7X Mk.2
31.	Potentiometer Strip 'Q'	RV2	11560-A	11560-A
32.	Knob Assembly Complete 'Q'		16103-V	16103-VX
33.	Divide by two Fixed Contacts (on board)		3214-303	3214-304
34.	Divide by two Spring Contact		3213-304	3213-304
35.	Divide by two Fixed Contact		3213-302	3213-303

SWITCH RING ASSEMBLIES

Item No.	Description	Circuit Ref.	Part No. 7 Mk. 2	Part No. 7X Mk.2
1.	Front Panel Moulded (Bare)		3884-201	3884-208
2.	Switch Cam (for d.c. range switch)		3161-302	3161-307
3.	Switch Brush Arm Assembly		16103-C	16103-C
4.	Switch ring		3214-109	3214-109
5.	Click Ball Spring		3171-305	3171-305
6.	Click Ball		23148-505	23148-505
7.	D.C. Switch Knob and Carrier (Engraved AC)		20796-A	20796-AX
8.	Contact Plate		3553-702	3553-702
9.	A.C. Switch Knob and Carrier (Engraved DC)		20796-B	20796-BX
10.	Switch Cam (for a.c. Switch)		3161-106	3161-107
11.	Set of Window Clips		16103-A0	16103-A0
12.	Window Glass		3862-705	3862-705

TOP RESISTANCE BOARD ASSEMBLY

Item No.	Description	Circuit Ref.	Part No. 7 Mk. 2	Part No. 7X Mk. 2
1.	Top Resistance Board Bare		3842-348	3842-348
†2.	4922 Ω Resistor $\pm .5\%$ MF	R1	26454-716	26454-716
*3.	17.7 Ω Resistor $\pm .5\%$ MF	R3	26438-976	26438-976
*4.	438 Ω Resistor $\pm .5\%$ MF	R2	26447-644	26447-644
5.	450 Ω Resistor $\pm .3\%$ MF	R11	26447-709	26447-709
6.	4.5k Ω Resistor $\pm .3\%$ MF	R10	26454-509	26454-509
7.	44.2k Ω Resistor $\pm .3\%$ MF	R9	26461-263	26461-263
8.	750 Ω Resistor $\pm 10\%$ CARBON	R6,R8	26125-770	26125-770
9.	149.2k Ω Resistor $\pm .3\%$ MF	R7	26463-792	26463-792
10.	20 Ω Resistor $\pm .3\%$ MF	R24	26441-212	26441-212
11.	10 Ω Resistor $\pm 1\%$ MF	R23	26437-818	26437-818
12.	100 Ω Resistor $\pm .2\%$ MF	R26	26444-609	26444-609
13.	25 Ω Resistor $\pm .3\%$ MF	R19	26441-676	26441-676
14.	20k Ω Resistor $\pm 5\%$ CARBON	R16,R17	26132-804	26132-804
15.	300k Ω Resistor $\pm .3\%$ MF	R5	26465-218	26465-218
16.	200k Ω Resistor $\pm 20\%$ CARBON	R4	26135-828	26135-828
17.	60 Ω Wound Bobbin	R25	30006-PF	30006-PF

* On earlier models these would be windings on a resistor board with Item 3 listed under Panel Assembly. Individual bobbins or metal film resistors are interchangeable with the original wound sections.

† On earlier models this resistor is located in the battery box.

NOTE: The 0.0001 μ F capacitor previously located on this board not used in current production. See APPENDIX for earlier models. R6, R8 supplementaries if required - nominal value.

BOTTOM RESISTANCE BOARD ASSEMBLY

Item No.	Description	Circuit Ref.	Part No. 7 Mk. 2	Part No. 7X Mk. 2
1.	Bottom Resistance Board Bare		3842-348	3842-348
*2.	477 Ω Resistor $\pm .5\%$ MF	R22	26447-840	26447-840
*3.	4940 Ω Resistor $\pm 1\%$ CARBON	R21	26783-523	26783-523
*4.	250 Ω Resistor $\pm 1\%$ MF	R20	26446-477	26446-477
*5.	1.125 Ω Wound Bobbin	R13	30006-SK	30006-SK
*6.	11.25 Ω Wound Bobbin	R12	30006-TK	30006-TK
7.	0.01 μ F Capacitor	C3	27537-336	27537-336
8.	1 μ F Capacitor	C2	27538-319	27538-319
†9.	0.047 μ F Capacitor (as required)		27537-340	27537-340
†10.	0.1 μ F Capacitor (as required)		27538-307	27538-307
X11.	.1125 Ω Winding	R14	-	-
X12.	.0125 Ω Winding	R15	-	-

* On earlier models these resistors may be wire wound. They can be replaced by metal film resistors or complete assemblies with minor circuit modification.
Item 2 previously 470 Ω .

† Items 9 and 10 used in some models across C2 as required.

X Not supplied as a spare.

MOVEMENT ASSEMBLY

Item No.	Description	Circuit Ref.	Part No. 7 Mk. 2	Part No. 7X Mk.2
1.	Complete Movement		40638-Y	40638-Y
†2.	Scaleplate (Various calibrations selection of six)		3824	3824
3.	Mirror		3236-202	3236-202
4.	Mirror Retaining Plate		3682-504	3682-504
5.	Top Jewel Screw Assembly		20673-F	20673-F
6.	Locknut for Top Jewel		3457-508	3457-508
7.	Crank Lever		3554-701	3554-701
8.	Crank Lever Plate		3556-101	3556-101
9.	Flat Spring		3512-105	3512-105
10.	Hairsprings		3178-314	3178-314
11.	Moving Coil Assembly		40024-D	40024-D
12.	Magnet and Pole Piece Assembly		10442-G	10442-G
13.	Pivots		3313-103	3313-103
14.	Swamp Bobbin (uncalibrated)		30006-G	30006-G
15.	Pointer		16103-Z	16103-Z
16.	Locknut for Bottom Jewel Screw		3435-702	3435-702
17.	Movement Frame		3732-412	3732-412
18.	Zero Adjuster		3628-120	3628-120
19.	Ratchet Plate		3147-101	3147-101
20.	Bridge Piece		3557-405	3557-405
21.	Insulator Bottom Jewel		3814-302	3814-302
22.	Shunt Plate		3573-803	3573-803
23.	Bottom Jewel Screw		20673-J	20673-J

† The number marked at the centre base of the scaleplate will be required. However, if the movement has been repaired the characteristics may differ and calibration may not be accurate.

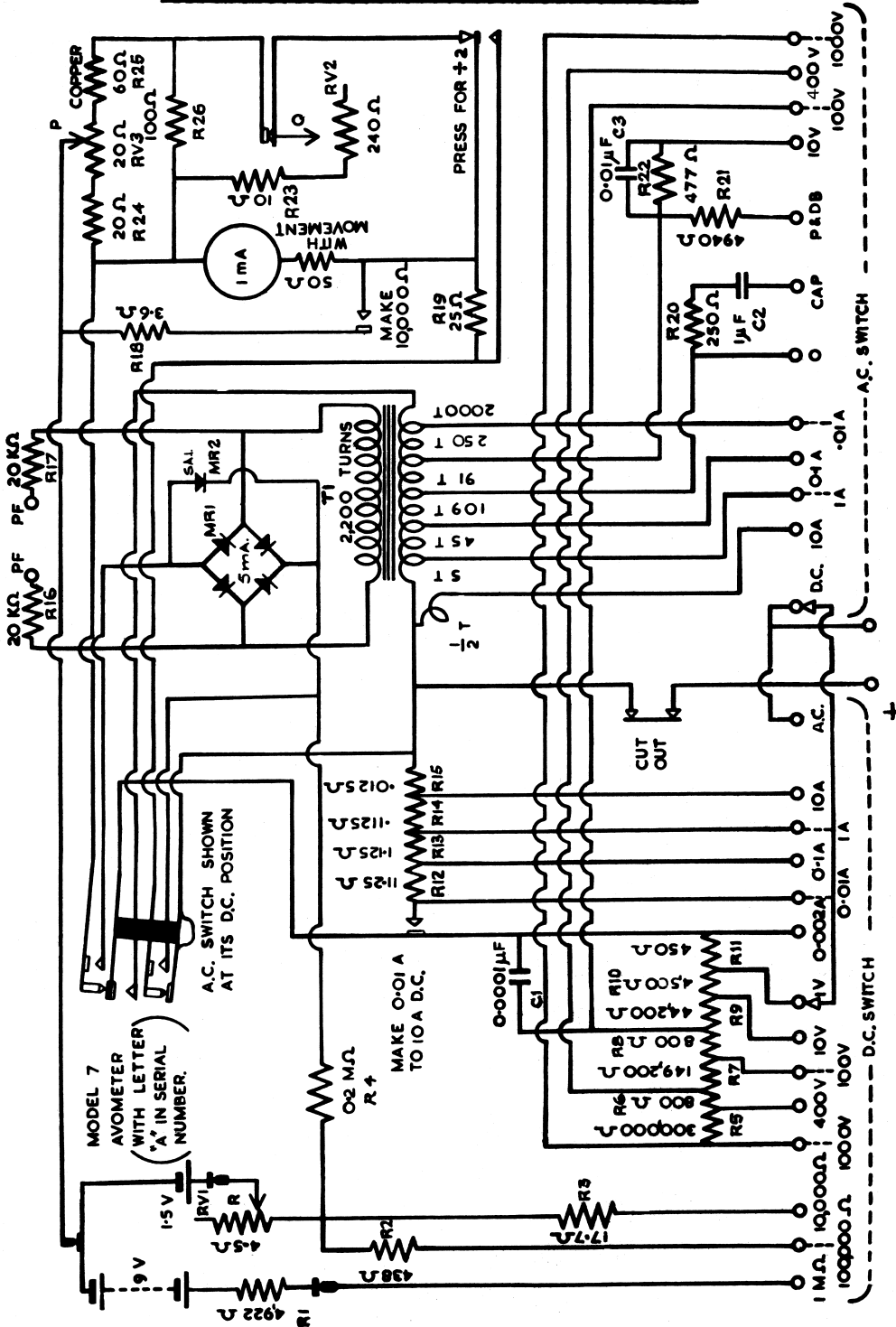
APPENDIX

	Part No. (Model 7)	Part No. (Model 7X)
<u>SPARES ONLY APPLICABLE TO THE MODEL 7 Mk. 1 AVOMETER</u> (to 1959 approx.)		
Terminal Black (Short type)	3153-504	3153-504
Top Resistance Board	20134-A	20134-A
Bottom Resistance Board	20834-A	20834-A
Ohms Coil	12774-B	12774-B
Fixed Cut out Contacts (Right hand)	10696-A	10696-A
Fixed Cut out Contacts (Left hand)	10696-B	10696-B
Cut out Guide Pillar	3343-102	3343-102
Half Switch (DC)	16103-A	16103-A
Half Switch (DC)	16103-B	16103-B
Switch Contact Assembly (AC)	20840-A	20840-A
Modified Switch Knob (DC)	21266-A	21266-A
Modified Switch Knob (AC)	21266-B	21266-B
0.0001 μ F Capacitor	27365-420	27365-420
0.01 μ F Capacitor	27352-444	27352-444
1 μ F Capacitor	12049-529	12049-529
Movement Assembly	40638-N	40638-N
Moving Coil Assembly	40024-A	40024-A
Hairspring Assembly	3178-304	3178-304
Top Jewel	20673-B	20673-B
Bottom Jewel	20673-C	20673-C
Battery Box Assembly	40022-C	40022-C

SPARES APPLICABLE TO THE EARLY AVOMETER MODEL 7 Mk.2 (Approx.1950/1955)

Terminal Black (Long Type Captive)	3153-505	
Top Resistance Board	20835-A	20835-AX
Bottom Resistance Board	20834-A	20834-AX
0.0001 μ F Capacitor	27365-420	27365-420
0.01 μ F Capacitor	27352-444	27352-444
1 μ F Capacitor	12049-529	12049-529
Movement Assembly	40638-N	40638-N
Moving Coil Assembly	40024-A	40024-A
Hairspring Assembly	3178-304	3178-304
Top Jewel	20673-B	20673-B
Bottom Jewel	20673-C	20673-C
Battery Box Assembly	40022-C	40022-AX

CIRCUIT DIAGRAM (MODEL 7 Mk. 2 AVOMETER)





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