



**SERVICE INFORMATION**  
and  
**SPARE PARTS LIST**  
for  
**A.W.A. RADIOGRAM**

**MODEL**  
**B144 ARENA**

# CHASSIS SERVICE INFORMATION

## Series 8 M3 Medium Wave Radiogram.

### POWER OUTPUT

Typically 5 watts R.M.S. in each channel at 1 kHz into 8 ohms.

### RESPONSE RANGE

30 Hz to 15 kHz  $\pm$  3dB.

#### NOTE!

1. Remove mains plug before commencing work on chassis.
2. Standard current through output transistors should be between 0.4 - 3mA at 20°C (68°F). When replacing output transistors set standing current to within these limits by selecting the appropriate resistor network from circuit diagram. When measuring collector current, volume control must be set at minimum. Collector current may be measured by:
  - a. Milliammeter in series with collector lead.
  - b. Milliammeter in H.T. lead, connect bases together in one channel. Drop in H.T. current will be standing current in that output pair.

### TO REMOVE CHASSIS

1. Remove control knobs by pulling straight off.
2. Remove back.
3. Disconnect the pick-up leads, speaker leads and the gram mains leads.
4. Remove four 4BA nuts holding chassis to cabinet.
5. The chassis can now be removed for service work.

### ALIGNMENT INSTRUCTIONS

#### 1. EQUIPMENT REQUIRED

- a. A signal generator covering the range 450 kHz to 1.6 MHz modulated 30% at 400 or 1000 Hz.
- b. An audio output meter capable of reading 500mW across 8 ohms, e.g. A voltmeter will indicate a power output of 500mW when the voltage reads 2V across an 8 ohm speaker.
- c. A non-metallic trimming tool suitable for adjusting the I.F., R.F. and oscillator coils.
- d. A 100pf dummy aerial, or radiating loop.

**CAUTION!** Do not screw the I.F., Osc. or R.F. cores hard down at the bottom of their travel as this may cause the coil bobbin to crack.

#### 2. I.F. ALIGNMENT

- a. Set the signal generator to 455 kHz. Couple the output from the signal generator through a .1uF capacitor into the base of VT2.
- b. With the volume control at maximum peak T5 to 455 kHz, T4 to 458 kHz, and T3 to 452 kHz for maximum output, adjusting the attenuator to keep the output below 500mW.

#### 3. R.F. ALIGNMENT

**NOTE!** Datum and calibration marks are indicated by a dot on the scale. Calibration points 600 kHz - 1000 kHz - 1500 KHz.

- a. Connect the signal generator, through a 100pf dummy aerial, to the aerial or use a radiating loop.
- b. Close the gang and set the pointer to the gang closed datum mark on the dial scale.
- c. Tune the pointer to the 600 kHz calibration mark and peak the oscillator coil, R.F. coil and aerial rod tuned winding for maximum output, (volume control at maximum) adjusting the attenuator on the signal generator to keep the audio output below 500 mW.
- d. Tune the pointer to the 1500 kHz calibration mark and peak the oscillator, R.F. and aerial trimmers for maximum, keeping the audio output level below 500mW.
- e. Repeat steps c. and d. until no further improvement in output is obtained.

## PARTS LIST

Resistors all 1/2 watt unless stated otherwise

CIR. REF.	DESCRIPTION	AWA & AIL PART NOS.	F & P PART NOS.
R1	Resistor 1M ohm ± 10%	X321.021073	21073
R2, 49, 50	" 150K ± 10%	X321.021063	21063
R4, 16	" 22K ± 10%	X321.021053	110137
R6, 30, 67, 68	" 4.7K ± 10%	X321.021045	21045
RB As Required	" 12K ± 10%	X321.021050	110138
R9, 31	" 100K ± 10%	X321.021061	21061
R10	" 1.5K ± 10%	X321.021039	21039
R17, 26	" 33K ± 10%	X321.021056	21056
R18, 28	" 2.2K ± 10%	X321.021041	21041
R21	" 300 ohm ± 5%	X321.021460	110139
R22	" 150K ± 10%	X321.021525	110140
R27	" 22K ± 10%	X321.021053	110137
R29	" 1.5K ± 10%	X321.021039	21039
R32	" 47K ± 5%	X321.021513	110141
R33	" 560K ± 5%	X321.021539	110142
R34	" 2.7K ± 5%	X321.021483	110143
R41, 42, 43, 44	" 560K ± 10%	X321.021070	110043
R45, 46	" 27K ± 10%	X321.021054	21054
R47, 48	" 390K ± 10%	X321.021058	21058
R59, 60	" 3.3M ohm ± 10%	X321.021079	110101
R61, 62	" 120K ± 10%	X321.021062	110042
R63, 64	" 1.2M ohm ± 10%	X321.021701	110100
R65, 66, 90	" 2.7K ± 10%	X321.021042	21042
R69, 70, 89	" 22 ohm ± 5%	X321.021433	110045
R71, 72	" 10 ohm ± 5%	X321.021425	110044
R73, 74	" 6.8 ohm ± 10%	X321.021491	21011
R75, 76, 77, 78	" 5.6K ± 5%	X321.021469	110097
R79, 80	" 680 ohm ± 10%	X321.021639	110096
R81, 82, 83, 84	" 1 ohm ± 10%	X321.021529	21639
R85	" 220K ± 5%	X321.021529	110099
R86	" 180K ± 5%	X321.021527	110047
R87, 88	" 47 ohm ± 10%	X321.021021	21021
C1	Capacitor .0047uF ± 10% 50V DC	X361.010094	110144
C3, 2, 4, 16, 19, 59	" .02uF ± 20% 50V DC	X316.010102	10102
60, 22, 27, 29, 30, 32	" "		
C5	" .0039uF ± 10% 50V DC	X316.010093	110145
C6	" 27pF ± 10% N750	X312.040000	110146
C8	" 10pF ± 10% 500V	X312.010087	110147
C9	" 15pF ± 10% N2000	X312.010290	10290
C10	" 1000pF ± 2%	X312.010031	10031
C18	" 330pF ± 25% N750	X312.010289	10289
C20	" 33uF 3V Electrolytic	X311.010125	10125
C26	" 100uF 10V "	X311.010203	10203
C31, 33	" .001 ± 20% 50VW	X316.010103	110148
C34, 63, 64	" 220pF ± 10% 50V	X312.010089	110036
C41, 42	" 270pF ± 10% 500V	X312.010085	10085
C43, 44, 45, 46	" 820pF ± 10% 500V	X312.010083	10083
C49, 50	" "		
C47, 48	" .0022uF ± 20% 50V	X312.010107	110095
C51, 52	" .0018uF ± 10% 50V	X316.010109	10109
C52	" 470uF 25VW Electrolytic	X311.010201	10201
C55	" 10uF 16V "	X311.010221	10221
C56	" 10uF 25V Electrolytic	X311.010304	10304
C57, 68	" 100uF 16V "	X311.010062	10062
C59, 70	" 470uF 16V "	X311.010119	10119
C99	" 1000uF 25V "	X311.010118	10118
RV4	Potentiometer 3M ohm + 3M ohm Linear Volume	D327.022090	22090
RV1	" 3M ohm + 3M ohm Log. Treble	D327.022091	22091
RV2	" 5M ohm + 5M ohm Lin. Bass	D327.022092	22092
RV3	" 1M ohm Lin. Balance	D327.022093	22093

## SWITCH

3 position, 3 pole "TROLEX"

E349,002645

2645

## CIR. REF.

AWA & AIL  
PART NOS.F & P  
PART NOS.

## FUSE

Anti-surge, 100mA

X325.003275

110102

## DIODES

MR1, 3, 4, 5, Diode, CB-C6, BYX36 or MR9001  
MR2 " AA138

X361.022521

22521

## TRANSFORMERS

T6 Mains Transformer  
Aerial Coil & Rod  
T3 1st I.F. Transformer  
T4 2nd I.F. Transformer  
T5 3rd I.F. Transformer  
T1 R.F. coil  
T2 Oscillator CoilP383.040000  
P383.015433  
P381.015474  
P381.015475  
P381.015476  
P381.015470  
P381.015471110105  
19433  
110149  
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19471

## TRANSISTORS

VT1, 2, 3, 4 Transistor BF254  
VT8/13 Transistor AC117  
VT9/14 " AC175 1 Matched Pairs  
VT5/VT10 " 8C148c or NX1131  
VT6/VT11 " 8C150b  
VT7/VT12 " 8C148cX361.022713  
X361.002385  
X361.022708  
X361.022740  
X361.02270322713  
2385  
22708  
110104  
22703

## MISCELLANEOUS

## NOTE!

Parts common unless stated otherwise.

Badge, F & P  
 Badge, Murphy MG14-43  
 Badge, Super Stereo MG14-45  
 Badge, Radio B144  
 Back Printed MG14-42  
 Back Printed MG14-43  
 Back Printed MG14-45  
 Back Printed B144  
 Cabinet MG14-42  
 Cabinet MG14-43  
 Cabinet MG14-45  
 Cabinet B144  
 Cartridge C1 with stylus  
 Cartridge SC9M  
 Clamp, Mains Cord  
 Clamp, Cable  
 Dial Cord  
 Dial Scale MG14-42  
 Dial Scale MG14-43  
 Dial Scale MG14-45  
 Dial Scale B144  
 Geng Tuning  
 Knob Control  
 Lamp 6.5V 300mA  
 Lampholder  
 Mains Cord & Plug  
 Nameplate - Murphy MG14-45  
 Nameplate MG14-45  
 Record Changer C110 MG14-45, B144  
 Record Changer BSR UA25  
 Speaker 9" x 6"  
 Washer Felt (for under knob)

E273.200901  
E273.200471  
E273.200232  
E273.201242  
P231.040001  
P231.016258  
X231.016258  
P231.015083  
P211.300001  
P211.016451  
X211.164590  
P211.164570  
X413.020235  
X413.040500  
E647.002621  
E647.001026  
X188.001209  
P283.040001  
P283.040000  
P283.040000  
D283.017837  
E317.003457  
E281.076891  
M424.016882  
M343.050696  
D088.025105  
E273.201260  
D273.117990  
X411.040006  
X411.004425  
P417.012517  
X622.017790

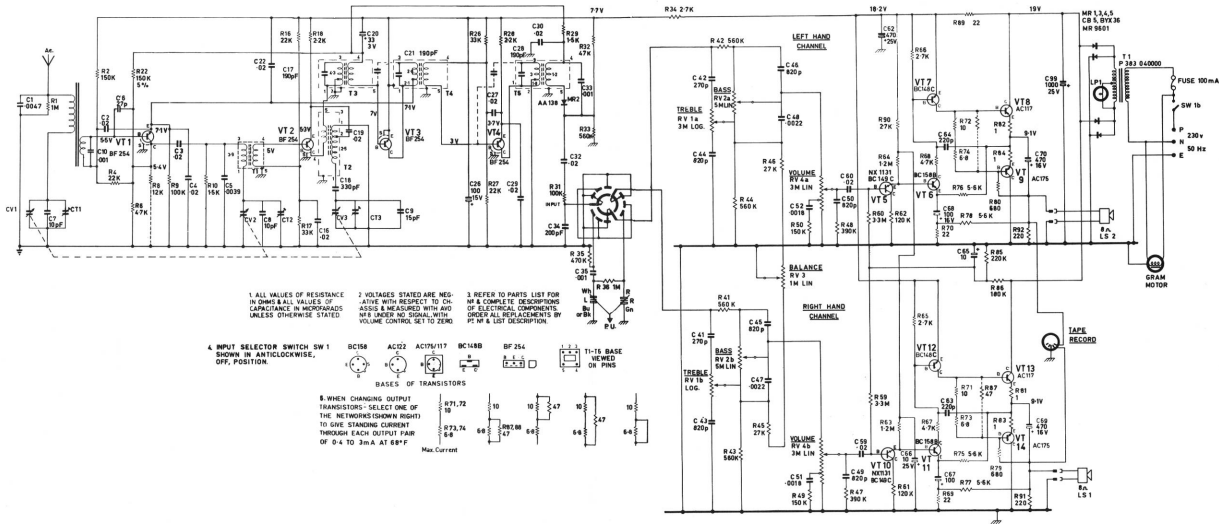
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## NUTS, SCREWS &amp; WASHERS

Nut, 6BA Hex, head, output transformer mounting  
 Nut, 4BA Hex, head, chassis mounting  
 Nut, 4BA "DOTLCC", speaker fixing  
 Screw, Wood 6 x 5/8" cabinet back, cable clamp  
 Screw, 4A x 3/8, Connector block  
 Screw, 6BA x 3/8, output transformers  
 Washer, 6BA S/P, output transformers  
 Washer, 4BA flat, speaker fixing  
 Washer, 4BA S/P Chassis mounting  
 Washer, 2BA plain, cabinet back

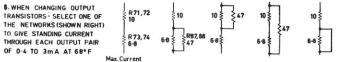
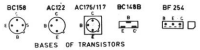
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M610.103633  
K622.631186  
X622.002250  
M622.016646  
M622.491701

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- 1. ALL VALUES OF RESISTANCE IN OHMS & ALL VALUES OF CAPACITANCE IN MICROFARADS UNLESS OTHERWISE STATED
- 2. VOLTAGES STATED ARE NEGATIVE WITH RESPECT TO CHASSIS & MEASURED WITH AVO MF UNDER NO SIGNAL, WITH VOLUME CONTROL SET TO ZERO
- 3. REFER TO PARTS LIST FOR MF & COMPLETE DESCRIPTIONS OF ELECTRICAL COMPONENTS. ORDER ALL REPLACEMENTS BY P/N & LIST DESCRIPTION.

4. INPUT SELECTOR SWITCH SW 1 SHOWN IN ANTICLOCKWISE, OFF, POSITION.



Max. Current

5. WHEN CHANGING OUTPUT TRANSISTORS - SELECT ONE OF THE NETWORKS (SHOWN RIGHT) TO GIVE STANDING CURRENT THROUGH EACH OUTPUT PAIR OF 0.4 TO 3mA AT 68°F