

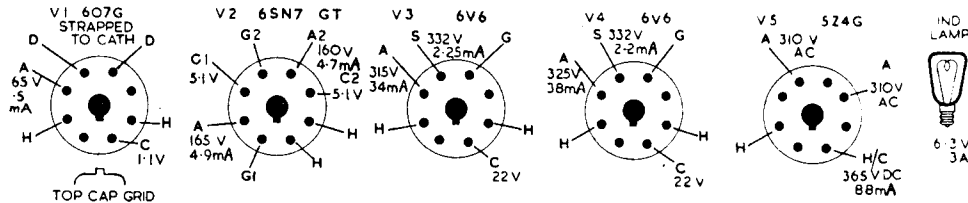
BSR AMPLIGRAM AG 4 and AG 40

Four-valve, plus rectifier, portable gramophone and amplifier for 200-250V 50 c/s. Fitted with magnetic pick-up and AC induction turntable with auto-stop. Push-pull output stage delivers 10 watts to externally connected speakers. Provision for using either moving-coil or crystal microphones. Housed in attractive red-crackle finished metal carrying case. Weight complete 34 lb. Made by Birmingham Sound Reproducers, Ltd., Old Hill, Staffordshire.

CIRCUIT consists of a high-gain triode V1, feeding into a double-triode V2, which in turn drives the push-pull beam tetrode output valves V3 and V4. HT is provided by a full-wave indirectly heated rectifier V5.

Input to grid of V1 consists of two separate channels switched by means of S1.

PU Channel. A high-resistance magnetic pick-



up is connected through series resistor R1 to load resistor R2 and thence through S1 to grid V1.

Microphone Channel. Provision is made for the use of either a crystal type or low-impedance (15 to 40 ohms) microphone. Crystal microphone is plugged into socket J1, which connects it, through S1, to grid V1. When plug is inserted into J1 a pair of contacts is opened to disconnect the secondary L2 of moving-coil microphone matching transformer IPI, from across the grid circuit V1. Moving-coil microphone is plugged into J2, which connects it across primary L1 of IPI, the input matching transformer, and thence via contacts on J1 and S1 to grid V1.

V1 is operated as a high-gain amplifier. Cathode bias is obtained from R4 and decoupled by C9. The diodes are not used and are both strapped to the cathode. R5 is the anode load resistor. C2 feeds signal to R8, the volume control, and thence to grid of V2A. R7, C4 provide variable tone control at this stage.

Cathode of V2A is returned, through tertiary L5 of speaker output transformer, to cathode of V2B home to chassis through bias resistor R16. This introduces negative feedback voltages to cathode of V2A to reduce harmonic distortion.

R9 is anode load of V2A and has capacitor C3 shunted across it.

C7 applies signal at anode V2A to grid V3, one of the push-pull output valves, and also to potential divider network R14, R15, and thence to grid V2B. V2B is used as a phase inverter to drive the second push-pull output valve V4. R16 is cathode bias resistor and R10 anode load. C6 feeds signal to grid V4.

R17 is grid resistor of V4 and is shunted by capacitor C8. R14, R15 form the grid resistor of V3. R13 and R18 are grid stoppers. Cathode bias for V3, V4 is derived from R19 and C11.

Anode voltages for V3, V4 are obtained through centre-tapped primary L3 of push-pull output



BSR Ampligram AG 4 and AG 40

matching transformer OPI. Secondary L4 is tapped for 15-ohm and 7½-ohm speakers. L5 is used to provide negative feed-back voltage.

High tension is supplied by a full-wave indirectly heated rectifier V5. L8 supplies its anode voltages and L7 its heater voltage. L6, C12, C13 provide smoothing for HT line.

RESISTORS

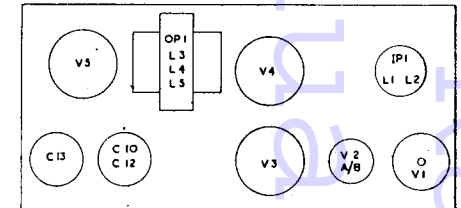
R	Ohms	Value
1	22K	1/4 W
2	3.3 K	1/4 W
3	1 Meg	1/4 W
4	2.2 K	1/4 W
5	220K	1/4 W
6	47K	1/4 W
7	500 K	Potentiometer (with Switch)
8	250 K	Potentiometer
9	22 K	1/4 W
10	22 K	1/4 W
11	2.2 K	1/4 W
12	2.2 K	1/4 W
13	10 K	1/4 W
14	220 K	1/4 W
15	22 K	1/4 W
16	680	1/4 W
17	220 K	1/4 W
18	10 K	1/4 W
19	270	2 W

INDUCTORS

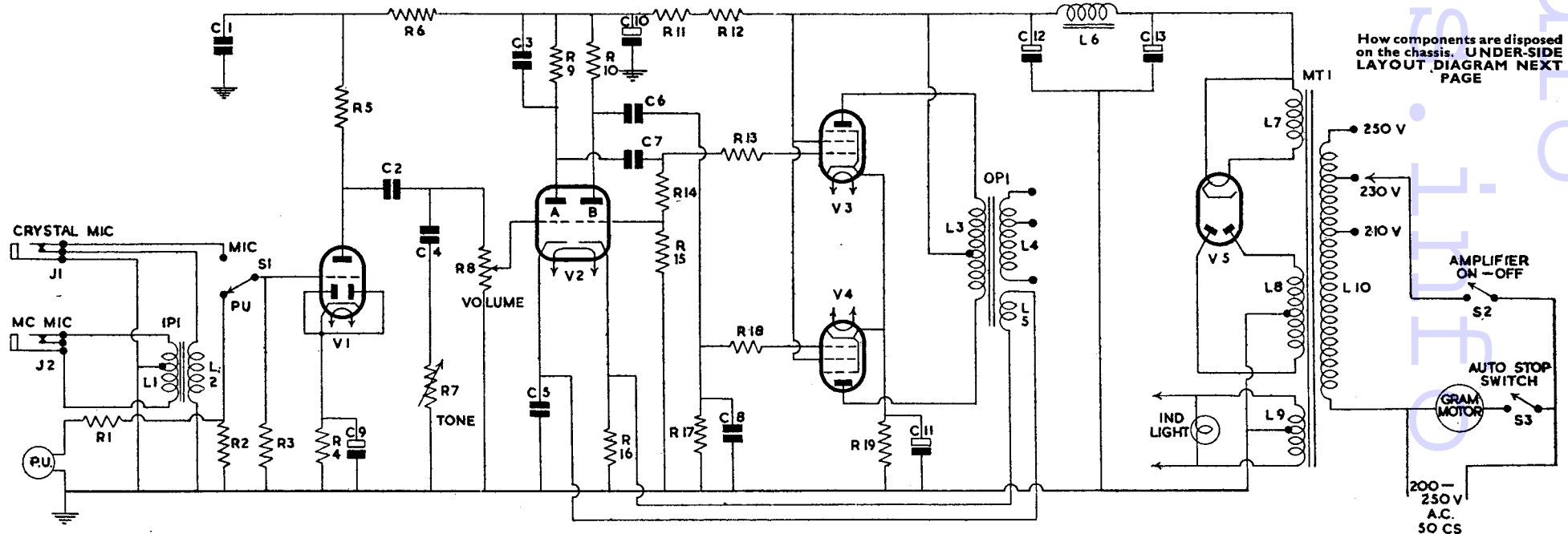
L	Ohms	Value
1	2500	
2	600	
3	1.5	
4	.6	
5	350	
6	Very low	
7	250	
8	Very low	
9	29	
10	2500	
PU	2500	

CAPACITORS

C	Mfds	Value
1	.5 Tubular	350 v
2	.1 Tubular	350 v
3	.001 Mica	
4	.002 Mica	
5	.001 Mica	
6	.1 Tubular	500 v
7	.1 Tubular	500 v
8	.0003 Mica	
9	25 Electrolytic	25 v
10	8 Electrolytic	500 v
11	25 Electrolytic	50 v
12	8 Electrolytic	500 v
13	16 Electrolytic	500 v



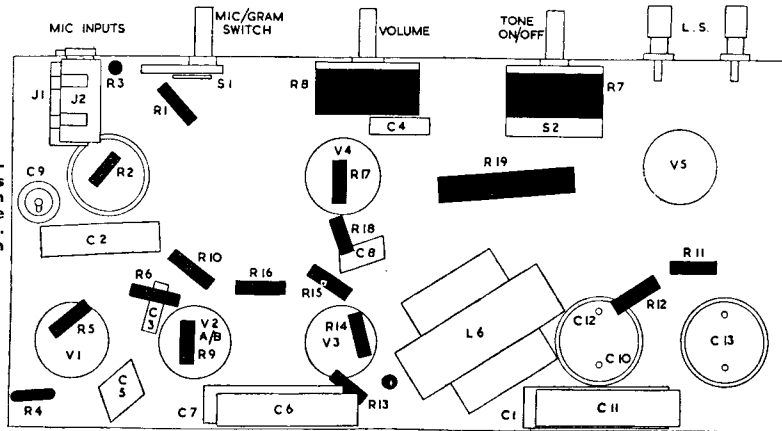
Notes.—Model AG 4 uses a Garrard pick-up and motor type AC6. Model AG 40 uses a Collaro pick-up and motor type AC37. Both motors are adjusted for 200/250V mains.



How components are disposed on the chassis. UNDER-SIDE LAYOUT DIAGRAM NEXT PAGE

BSR AMPLI- GRAM

This drawing identifies components mounted beneath the chassis of the BSR Ampligram. Other details on previous page



HMV III9—Continued

L21 of OP1, the output matching transformer, is connected in anode circuit of V4. R20 with C21 provides variable top cut. C22 is anode bypass capacitor.

Secondary L22 of OP1 is taken to ganged switches S22 S23 and thence to either L23, the internal speaker, or to R21 and external speaker sockets. S22, S23 allow internal and external speakers to be operated either together or individually. R21 is to prevent load on secondary of OP1 being removed should external speaker be disconnected whilst set is operating in external position.

HT is provided by a directly heated full-wave rectifier V5. L25 supplies its anode voltages and L26 its filament voltage. L24, the speaker field winding, with C30 and C31, provides HT smoothing. C5 is HF decoupler for HT supply.

Heaters of V1 to V4 are supplied from L27 as are the four 7V dial lamps.

Primary L28 of MT1 is tapped for mains input voltages 195/255V, 40/60 c/s. S24, ganged to R11, the volume control, is the on/off switch.

Dismantling. Minor replacements may be carried out by removing the back and the service hatch from underneath the cabinet. For ganging and major replacements the chassis must be removed.

Remove two front knobs (screw fixing) and pull off the tone-control knob at side of cabinet (spring fixing). Remove the card back (four screws) and the four pilot lamps (clip fixing). Unscrew the two cursors from the condenser drive wire. Remove four fixing screws from the underside of the cabinet and withdraw.

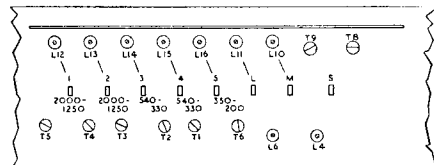
The scale and the two cursors are fitted to the cabinet.

Pointer Drive. Obtain wire from EMI Sales and Service. Form $\frac{1}{8}$ in. soldered loop at one end. Pass through hole in drum and place on anchor pin. Run wire as shown in diagram, assemble spring, twist wire and solder. Place chassis in cabinet, assemble cursors to wire, check setting of pointers (see alignment instructions).

TRIMMING INSTRUCTIONS

Before commencing trimming check calibration scale pointer. The trailing edge of "red tab" should coincide with 5 $\frac{1}{2}$ in. mark. If adjustment is necessary slacken the two screws securing scale and adjust scale.

Apply Signal as stated below	Tune Receiver to	Trim in Order stated for Max. Output
1) 465 kc/s to grid V2 via a .05 Capacitor	Press SW button. Vol. at Max. Tone Fully Anti-clockwise. Gang at Max.	Shunt L19 with 33K Resistor. Core L20. Shunt L20 with 33K Resistor. Core L19.
2) 465 kc/s to Grid V1 via a .05 Capacitor.	—	Shunt L17 with 33K Resistor. Core L18. Shunt L18 with 33K Resistor. Core L17.
3) 1427 kc/s to AE Socket via Dummy Aerial and press MW button. ...	Calibration Scale pointer to $\frac{3}{8}$ in.	T8, T7.
4) 588 kc/s as above	4 $\frac{1}{2}$ in.	Core L10, L4 and Repeat (3) and (4)
5) 300 kc/s as above and press LW button ...	1 $\frac{3}{8}$ in.	T9, T6
6) 162 kc/s as above	4 $\frac{3}{8}$ in.	Core L11, L6 and repeat (5) and (6)
7) 6 mc/s as above and Press SW Button.	5 $\frac{1}{2}$ in.	Adjust L8 Loop .. L2 Loop



There are two trimmers for each push-button station. Adjust coil core first, then the RF trimmer for required station

PIFCO

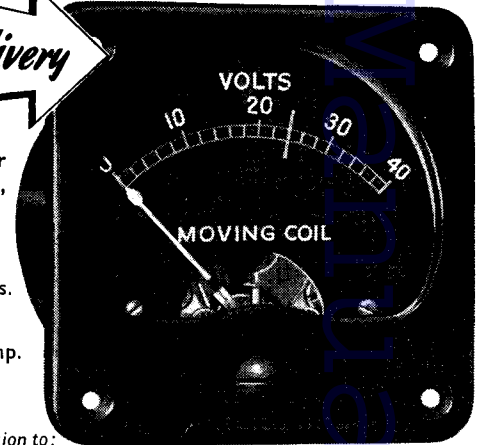
METERS at PRICES BELOW
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Panel-mounting moving-coil meter illustrated is in Black Bakelite case, 2 $\frac{1}{4}$ " x 1 $\frac{1}{2}$ ". 0-40 volts.

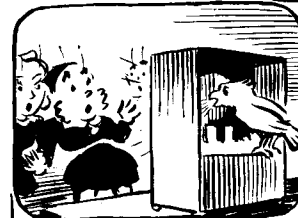
Also available are :

- Voltmeter 2 $\frac{1}{4}$ " x 1 $\frac{1}{2}$ " 0-20 Volts.
- Voltmeter 2 $\frac{1}{8}$ " x 1 $\frac{1}{2}$ " 0-600 Volts.
- Milliammeter 3" x 1 $\frac{1}{4}$ " 0-50 M.A.
- Milliammeter 1 $\frac{1}{2}$ " x 1 $\frac{3}{16}$ " 0-75 M.A.
- Ammeter 2 $\frac{1}{4}$ " x 1 $\frac{7}{8}$ " 50-0-50 Amp.
- Oil Pressure Gauge 2 $\frac{1}{4}$ " x 2 $\frac{1}{2}$ " 0-160 lbs.



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