

THE
HG88
MARK THREE

INSTALLATION
AND OPERATING
INSTRUCTIONS

INTEGRATED STEREO AMPLIFIER

THE HG88 MK. III INTEGRATED STEREO AMPLIFIER

INSTALLATION AND OPERATION INSTRUCTIONS

We recommend that these Instructions be read fully and carefully before any attempt is made to connect up or use the equipment.

MAIN AMPLIFIER SECTION

- (1) Check that the eight valves are securely seated in their holders and have not worked loose in transit.
- (2) Set the Mains Voltage Selector to the appropriate supply voltage. When the supply voltage falls between two tappings always use the higher tapping, i.e. Supply Voltage 230V use 240V tap.
- (3) Connect the link plugs on the output transformers to the impedance range nearest to that of the speakers being used.
- (4) Connect the loudspeaker leads to the 6-way Terminal Strip at the rear of the chassis; the two centre terminals may be used as earthing points for gramophone motors, etc.
- (5) Connect a suitable 3-pin Mains Plug Top to the 3-core Mains Lead. Colour Code: GREEN—Earth, RED—Live, BLACK—Neutral. In the case of a 2-pin Mains Plug the GREEN wire should be taken to a reliable earth.
- (6) For convenience the A.C. power for a gramophone motor, or other piece of auxiliary equipment, may be taken from the dual A.C. Outlet Socket at the rear of the amplifier chassis. These sockets are 'live' irrespective of whether the amplifier is switched on or not.
- (7) Two fuses are fitted to the amplifier protecting the mains primary and D.C. circuits, in the case of valve or component failure. If the equipment fails to light up when switched on check the mains fuse for continuity. If the equipment lights up but is silent then check the D.C. fuse.

FUSE RATINGS: A.C. Fuse 200–250V range. 1-amp anti-surge 20 × 5 mm.
110–125V range. 2-amp anti-surge. 20 × 5 mm.
D.C. Fuse 600 m/A anti-surge 20 × 5 mm.

METHOD OF MOUNTING

Chassis Model. The amplifier is suitable for mounting in either a vertical or horizontal position; in either case a cut-out measuring $14\frac{1}{2}'' \times 4\frac{1}{8}''$ must be provided in the cabinet panel, and a shelf measuring approximately $15'' \times 10''$ should be fitted to the cabinet so that it is level with the bottom edge of the cut-out. The amplifier chassis is secured to the shelf by means of three 4 B.A. bolts which pass through the shelf and locate in three hank bushes fitted to the chassis bottom cover. Suitable bolts and washers are provided with the set of accessories. The bottom cover itself may be used as a template for locating the fixing holes and ventilation grille opening in the shelf. First remove the bottom cover, secured in place by four 4 B.A. screws, and place on the shelf so that the front edge coincides with the front of the cabinet, mark through the three hank bushes and also mark the position of the louvres, so that a suitable cut-out can be made in the shelf. Drill three 4 B.A. clearance holes to take the three 4 B.A. fixing bolts. When mounted in a vertical position the chassis side flanges provide a measure of support, but on no account should these be relied upon as the sole support, and it is essential to secure the chassis to the shelf. In planning a cabinet installation it is essential to provide adequate ventilation both above and below the amplifier.

Case Model. The free-standing Case Model may be placed on any convenient shelf and it is simply necessary to ensure that adequate ventilation is provided; it is essential that the top ventilation grille is not obstructed in any way and, in particular, other pieces of equipment should not under any circumstances be placed on top of the amplifier case.

CONTROL UNIT SECTION

INPUT CONNECTIONS

All input connections are via standard miniature phono sockets located at the rear of the unit. Good-quality low-loss screened flex with an insulated outer covering must be used for all input connections, the braiding is soldered to the body of the phono plug provided, the centre conductor to the centre pin of the plug.

INPUT SELECTOR	SENSITIVITY	IMPEDANCE	CHARACTERISTIC
DISC (Magnetic)	4 m/V	68K	RIAA
DISC (Crystal/Ceramic)	65 m/V	2 megohms	Flat
TUNER	100 m/V	470K	Flat
TAPE REPLAY	100 m/V	470K	Flat
AUXILIARY	60 m/V (Adj.)	100K	Flat
TAPE REPLAY (Via Panel Socket)	600 m/V	250K (approx.)	Flat
TAPE RECORD OUTPUT	600 m/V (External load not to be less than 100K)		

DISC

The disc inputs are suitable for either magnetic or ceramic pick-up cartridges. The sensitivity and characteristics of the disc inputs are determined by the plug-in pick-up adaptor used, which should be inserted in the appropriate socket at the rear of the amplifier chassis. Choose the adaptor appropriate to the pick-up being used by reference to the list below. A GOLD and SILVER ADAPTOR are supplied as standard with each amplifier and will be found to match the majority of magnetic and ceramic cartridges likely to be encountered.

Colour Code *GOLD* (low output magnetic cartridges) suitable for:—DECCA FFSS Series: SHURE M7D, M8D, M44, M55 Series: TANNOY Varitwin MK II: NEAT: EMPIRE 108: GOLDRING 580, 600, 700: EAGLE GOLD M1007G: PHILIPS AG 3021, AG 3401, AG 3402: ADC 660, 770, Point-Four, Point-Four E: EMI EPU.

Colour Code *SILVER* (low output ceramic cartridges) suitable for:—BSR C1: DECCA Deram: GARRARD EV26A: N. MIERS C1: SUGDEN SCU1 Series: GOLDRING CS90.

Colour Code *RED* (high output crystal and ceramic cartridges) suitable for:—ELAC KST-102—103—103D—106: ELECTRONIC REPRODUCERS ER60, ER710, ER715: GARRARD GC3: SONOTONE 9TA: GOLDRING CS80, SX10L, CM60.

Colour Code *GREEN* (high output crystal cartridges) suitable for:—BSR SX1M, XIM, FUL-F1 TC8 M: ELECTRONIC REPRODUCERS ER703: GARRARD GC2: GOLDRING MX2L.

Colour Code *ORANGE* (low impedance crystal) suitable for:—PHILIPS AG-3060—3063—3301—3304—3305—3306—3310.

Colour Code *BLUE* (high output magnetic) suitable for:—EAGLE SILVER M1007F: ELAC MST1, STS222D: LEAK DYNAMIC: ORTOFON SPUGT: SHURE MD5, M65: CONNOISSEUR MK II L.P.

When connecting the pick-up lead on no account should the braiding be earthed to the motor or main amplifier.

A monaural pick-up should be connected to the left-hand input channel then, with the Input Selector at Disc M and the Function Selector at Mono A, output will appear at both loudspeakers. With Function Selector at Stereo output will appear at the left-hand speaker only.

When using a compatible stereo pick-up to play a monaural record the Input Selector should be set to Disc M, the outputs from the pick-up will then automatically be connected in parallel, and applied to the left-hand input channel. Again the Function Selector should be set to Mono A in order to obtain output at both loudspeakers. For normal stereo operation, i.e. using a stereo pick-up to play a stereo record, the Input Selector should be set to Disc S, the Function Selector to Stereo.

TUNER

Dual radio inputs are provided suitable for the connection of the majority of AM, FM and FM Stereo Multiplex receivers. Output from a monaural receiver should be connected to the left-hand input channel then, with the Function Selector at Mono A, output will appear at both loudspeakers.

TAPE

Provisions are made for the connection of tape decks and complete tape recorders. Inputs at the rear of the amplifier provide for play-back direct from tape recorders having built-in pre-amplifiers. If tape play-back direct from tape replay heads is required then the addition of a transistor booster unit is necessary. (We do not manufacture such a unit ourselves but suitable units are available.) The auxiliary input can be used where the signal level from the recorder is exceptionally high. It provides a flat response and incorporates a pre-set volume control. Tape Record Output Sockets are also provided at the rear of the amplifier, and are independent of all controls.

For the connection of a complete portable tape recorder a 5-pin Continental pattern socket is provided on the front panel for high impedance inputs. This socket provides record and play-back connections, and conforms to DIN standards. Tape replay via this socket is brought into operation by means of the Tape Slide Switch mounted at the top left-hand of the front panel. This switch may also be used to 'mute' the loudspeakers when recording from the Tape Record Sockets at the rear of the chassis.

Connections to the Tape Panel Socket are as follows (for socket numbering see circuit diagram):

- (1) Tape Replay Channel A.
- (2) Earth.
- (3) Tape Record Channel A.
- (4) Tape Replay Channel B.
- (5) Tape Record Channel B.

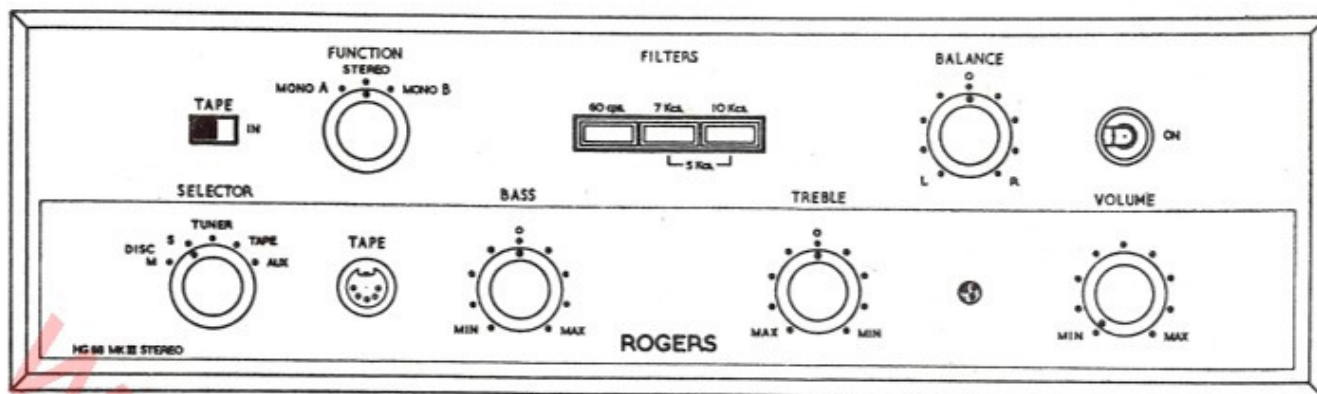
To Record. Whatever programme source is selected will appear at the RECORD sockets on the front panel and at the rear of the chassis, and will be unaffected by the settings of VOLUME, TONE or FILTERS. Recording level will be adjusted by means of the level control on the tape recorder.

The record signal will be present whether or not tape has been selected on the Input Selector or Tape Slide Switch. We must emphasise that the record signal is not suitable for feeding direct to tape record heads, a tape deck alone is therefore not sufficient and a complete tape recorder incorporating a record amplifier and bias oscillator is essential.

To Replay. Output from the Tape Replay Socket on the tape recorder should be taken to either the replay connections on the front panel or the tape replay connections at the rear of the chassis, and selected by the Tape Slide Switch or the TAPE position on the Input Selector respectively. With tape recorders having a separate replay head, monitoring of the recorded signal is possible. The monitor facility is, of course, only applicable when using the Tape Panel Socket.

AVOIDING HUM

With no inputs connected and the volume control at minimum the amplifier will be found to have a very low hum and noise level. If there is a marked increase in hum when a pick-up, tape recorder or radio unit are connected then all external connections should be carefully checked. The amplifier mains transformer must be located at least 18" away from pick-up and tape heads. The instructions of the manufacturers of pick-up, motors, etc., should be carefully observed with regards to earthing.



CONTROL FACILITIES

INPUT SELECTOR

Five-position rotary selector providing for DISC Mono and Stereo, TUNER, TAPE REPLAY and AUXILIARY Inputs. In the DISC Mono position the outputs from a compatible stereo pick-up are automatically connected in parallel and applied to the left-hand input channel.

BASS and TREBLE

Continuously variable ganged controls employing modified Baxendall circuit. Optimum settings depend on programme material, room acoustics and personal taste. It is, therefore, impossible to give 'recommended settings' and a start should be made with both controls at mid-position. It should not be attempted to employ a high degree of bass or treble boost at high volume levels.

VOLUME

Dual-ganged close tolerance control affecting over-all volume from all inputs has no effect on the Tape Record Output.

TAPE SLIDE SWITCH

Selects Tape Replay via Tape Panel Socket, also operates as a monitor switch, with tape recorders having a separate replay head.

FUNCTION

Three-position rotary switch providing stereo operation and mono operation, i.e. both outputs in parallel from a mono signal fed into either Input A or B.

FILTERS

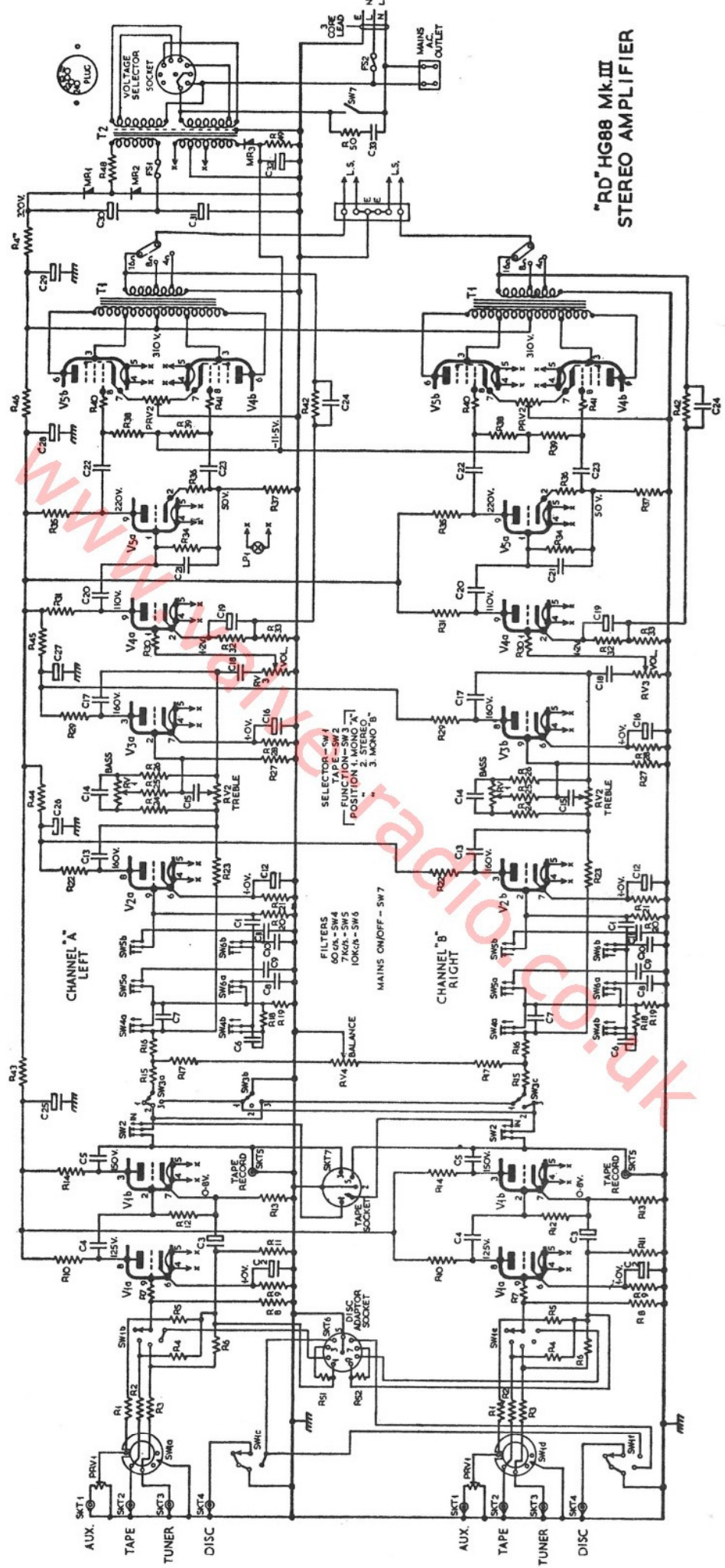
A three-position push-button switch provides low frequency cut-off and three high frequency cut-off settings. The left-hand push-button is independent and is of the push-on, push-off type, the remaining two are latched, i.e. pressing one releases the other. For no filter action all three buttons should be out and the latched buttons can both be released by light pressure.

BALANCE

A vernier control having sufficient range of control (9dB) to compensate for inequalities of recordings, etc., operates on all inputs.

ON/OFF SWITCH

Separate On/Off toggle switch fitted with click suppressors. Dial light adjacent to volume control indicates when the equipment is on.



RD HG88 Mk.III
STEREO AMPLIFIER

HG88 MK. III COMPONENT LIST

Resistor	Value ohms	Tolerance	Rating Watts	Type	Resistor	Value ohms	Tolerance	Rating Watts	Type
R1	220K	5%	1/2	High Stability	R34	1 meg	10%	1/2	Carbon
R2	470K	5%	1/2	High Stability	R35	47K	5%	1/2	High Stability
R3	470K	5%	1/2	High Stability	R36	1K	10%	1/2	Carbon
R4	33K	5%	1/2	High Stability	R37	47K	5%	1/2	High Stability
R5	33K	5%	1/2	High Stability	R38	470K	10%	1/2	Carbon
R6	33K	5%	1/2	High Stability	R39	470K	10%	1/2	Carbon
R7	4.7K	10%	1/2	Carbon	R40	22K	10%	1/2	Carbon
R8	820K	10%	1/2	Carbon	R41	22K	10%	1/2	Carbon
R9	2.2K	5%	1/2	High Stability	R42	4.7K	5%	1/2	High Stability
R10	220K	5%	1/2	High Stability	R43	22K	10%	1/2	Carbon
R11	Omitted				R44	10K	10%	1/2	Carbon
R12	8.2M	10%	1/2	Carbon	R45	10K	10%	1/2	Carbon
R13	1K	5%	1/2	High Stability	R46	5.6K	10%	1	Carbon
R14	100K	10%	1/2	Carbon	R47	125	10%	4	Wire Wound
R15	150K	5%	1/2	High Stability	R48	2.2	20%	1	Carbon
R16	150K	5%	1/2	High Stability	R49	22K	10%	1/2	Carbon
R17	33K	5%	1/2	High Stability	R50	220	10%	1/2	Carbon
R18	100K	5%	1/2	High Stability					
R19	470K	5%	1/2	High Stability	<i>Potentiometers</i>	<i>Value ohms</i>			<i>Type</i>
R20	470K	5%	1/2	High Stability	PRV1	100K			Carbon Aux./Pre-set
R21	1K	5%	1/2	High Stability	PRV2	25 ohms			Carbon Bias Balance
R22	100K	10%	1/2	Carbon					Pre-set
R23	680K	5%	1/2	High Stability	RV1	1meg+1meg LIN			Carbon Bass
R24	100K	5%	1/2	High Stability	RV2	500K+500K LIN			Carbon Treble
R25	470K	5%	1/2	High Stability	RV3	250K+250K LOG			Carbon Volume
R26	100K	5%	1/2	High Stability	RV4	250K LIN			Carbon Balance
R27	1M	10%	1/2	Carbon	<i>Valves</i>				
R28	1K	5%	1/2	High Stability	V1A and V1B	ECC.807			1 Valve per Channel
R29	100K	10%	1/2	Carbon	V2A and V2B	ECC.807			
R30	4.7K	10%	1/2	Carbon	V3A and V3B	ECC.807			
R31	220K	10%	1/2	Carbon	V4A and V4B	ECL.86			
R32	1.2K	10%	1/2	Carbon	V5A and V5B	ECL.86			
R33	220	5%	1/2	High Stability					

Capacitor	Value	Tolerance	Voltage	Type	Capacitor	Value	Tolerance	Voltage	Type
C1	2200pf	10%	400V	Polyester	C22	.1uf	10%	400V	Polyester
C2	30/50uf	—	3/6V	Electrolytic	C23	.1uf	10%	400V	Polyester
C3	30/50uf	—	3/6V	Electrolytic	C24	390pf	10%	125/400V	Polystyrene
C4	.022uf	10%	400V	Polyester	C25	16uf	—	350V	Electrolytic
C5	.1uf	10%	400V	Polyester	C26	16uf	—	350V	Electrolytic
C6	680pf	5%	125/400V	Polystyrene	C27	16uf	—	350V	Electrolytic
C7	2200pf	10%	400V	Polyester	C28	24uf	—	450V	Electrolytic
C8	680pf	5%	125/400V	Polyester	C29	24uf	—	450V	Electrolytic
C9	1000pf	5%	125/400V	Polyester	C30	100uf	—	350V	Electrolytic
C10	270pf	5%	125/400V	Polyester	C31	100uf	—	350V	Electrolytic
C11	400pf	5%	125/400V	Polyester	C32	50uf	—	25V	Electrolytic
C12	30/50uf	—	3/6V	Electrolytic	C33	.022	20%	250V A.C.	Polyester
C13	.1uf	10%	400V	Polyester	<i>Silicon Rectifiers</i>				
C14	4700pf	10%	400V	Polyester	MR1	BY114			Silicon Diode
C15	100pf	5%	125/400V	Polystyrene	MR2	BY114			Silicon Diode
C16	30/50uf	—	3/6V	Electrolytic	MR3	OA81			Germanium Diode
C17	.1uf	10%	400V	Polyester	<i>Fuses</i>				
C18	.047uf	10%	125/400V	Polyester	FS1	500/600 m/A			Anti-surge Fuse
C19	30/50uf	—	3/6V	Electrolytic	FS2	1 amp.			Anti-surge Fuse, 200-250V range
C20	.022	10%	400V	Polyester	FS2	2 amp.			Anti-surge Fuse, 100-125V range
C21	1000pf	10%	125/400V	Polystyrene					