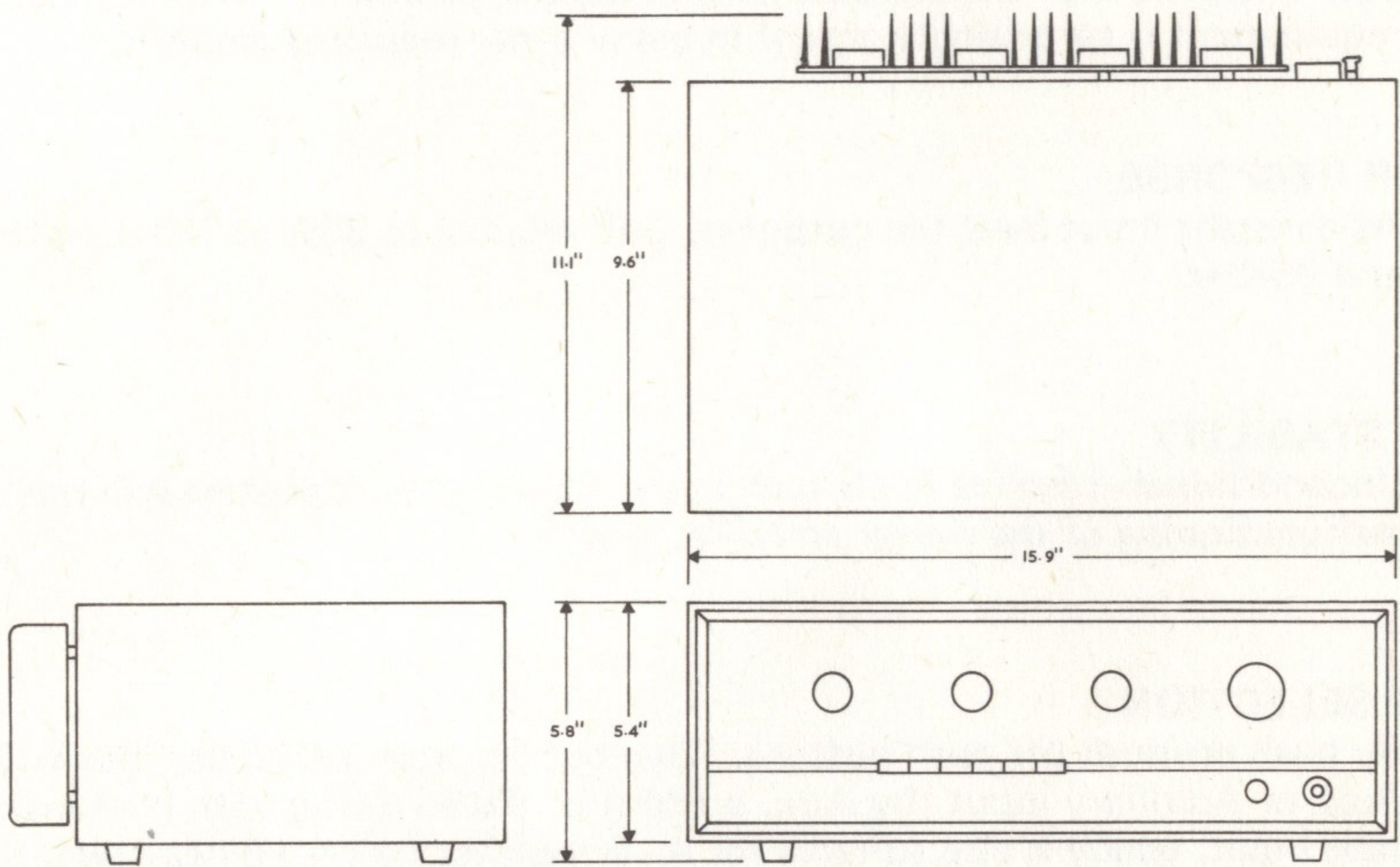


A21 (series three) INTEGRATED STEREO AMPLIFIER



POWER OUTPUT FROM LOUDSPEAKER SOCKETS

quoted at clipping levels.

8 ohm loads	20W RMS per channel (40W from both channels simultaneous operation.)
16 ohm loads	16W RMS per channel.
4 ohm loads	25W RMS per channel.

HEADPHONE OUTPUT

From TRS jack socket on front panel, fed via an attenuator network from the loudspeaker circuits to be suitable with the majority of 600, 300 and 8 ohm 'phones. The loudspeaker output is automatically cut off when the headphone jack is inserted.

TAPE RECORDER OUTPUT

From the common 5 pin DIN socket on the rear panel used for tape record and replay and wired in accordance with DIN standards. The output is a direct connection from the radio and aux. inputs when selected or approximately 200mV at average modulation when the disc facility is in use and correctly loaded. The minimum presented impedance to the tape output should be 100K ohms. Recorders without a 'line' or 'aux.' input to suit may be fed through a standard adaptor link which is available.

HARMONIC DISTORTION

Typically 0.1% into 8 ohm loads at 1KHz just prior to clipping. Little rise at the frequency extremes. With reducing power the distortion falls progressively. There is no "come back" significant of cross over distortion at a lower power level. The distortion products are predominantly 2nd, 3rd, and 4th harmonic with negligible higher order products associated with dissonance and listening fatigue.

OUTPUT IMPEDANCE

Approximately 0.2 ohm in series with 2,500 uF—provides a damping factor in excess of 30 : 1 on 8 ohm loads.

FREQUENCY RESPONSE

± 1 dB 30Hz to 20KHz. . Although the amplifier is fitted with infinitely variable bass and treble controls the response is guaranteed to be correct on both channels with the controls in their central positions. This rather obvious requirement is surprisingly absent in many other makes of amplifiers

POWER RESPONSE

At constant input level the output is -3 dB relative to 20W at 1KHz at 15Hz and 35KHz.

LOAD STABILITY

Unconditional—reactive loads such as electrostatic loudspeakers will not cause malfunctioning of the power amplifier section.

INPUT SELECTION

By push on/push off push buttons. Two buttons select Disc (by disc button) Aux. or Auxiliary input (by Aux. button) or Radio (using both buttons). The tape input, which is also suitable for A—B monitoring on a 3 head recorder, is selected by the Tape button. This switch is "break before make" to prevent clicks or bleeps being applied to a recording when the monitoring facility is being used.

INPUT CONNECTIONS

By four 5 pin DIN sockets on the rear panel.

INPUT SENSITIVITIES (referred to 25 Watt output level, 4 ohm loads, volume control at maximum).

Disc 2.5mV, presented impedance ~ 47 K ohms.

Radio

Aux. 100mV, minimum presented impedance 180K ohms at maximum volume. Typical presented impedance 220K ohms.

The disc sensitivity was deliberately chosen to give the best operational condition of the volume control i.e. at 12.00 to 2.00 o'clock using high grade cartridges such as the Shure V15, Stanton 681 etc. The disc input will accept an input of 130mV at 1KHz without overload. The other inputs feed directly to the volume control and thus have an infinite overload figure.

SIGNAL TO NOISE RATIO

(weighted to 30 phon equal loudness correction).

Disc input	73dB	measured with the input terminated and the volume control at maximum.
Aux. radio or tape inputs	85dB	

DISC EQUALISATION

To B.S.1928 i.e. R.I.A.A. Equalisation of disc amplifier maintained over the frequency band ± 0.5 dB except at extreme L.F. where action of rumble filter will not attenuate 30Hz more than 2dB.

FUNCTION CONTROLS

By two push on/push off buttons to select (a) normal stereo; (b) left input only fed to both outputs; (c) right input only fed to both outputs; (d) left and right inputs mixed and fed to both outputs i.e. mono.

FILTER CONTROL

Push on/push off button selects filter, turnover point 7KHz, slope 12dB per octave. A high pass filter is permanently in operation on the disc input operating below 30Hz at a slope of 18dB per octave.

CONTROL KNOBS

Volume	Logarithmic, channel balance maintained within 1dB to -50dB attenuation.
Balance	$\pm 90^\circ$ rotation provides 6dB variation of left/right balance. Further rotation progressively turns the opposite channel completely off.
Bass and Treble	Continuously variable controls 'hinging' at 500Hz provide maximum lift and cut figures of 14dB at the limits of the frequency band.

CIRCUIT CONFIGURATION

The amplifier is electrically and physically in two sections, the pre amplifier or control unit and the power amplifier. The pre-amplifier is again in two electrical sections. The first section is a feedback pair of high gain transistors forming the disc amplifier. The output of the disc amplifier or one of the high level inputs is selected and fed to an emitter follower circuit which in turn feeds the tone control, filter and output stage. The power amplifier is to the same circuit as the P51 but with lower H.T. voltages.

CONSTRUCTION

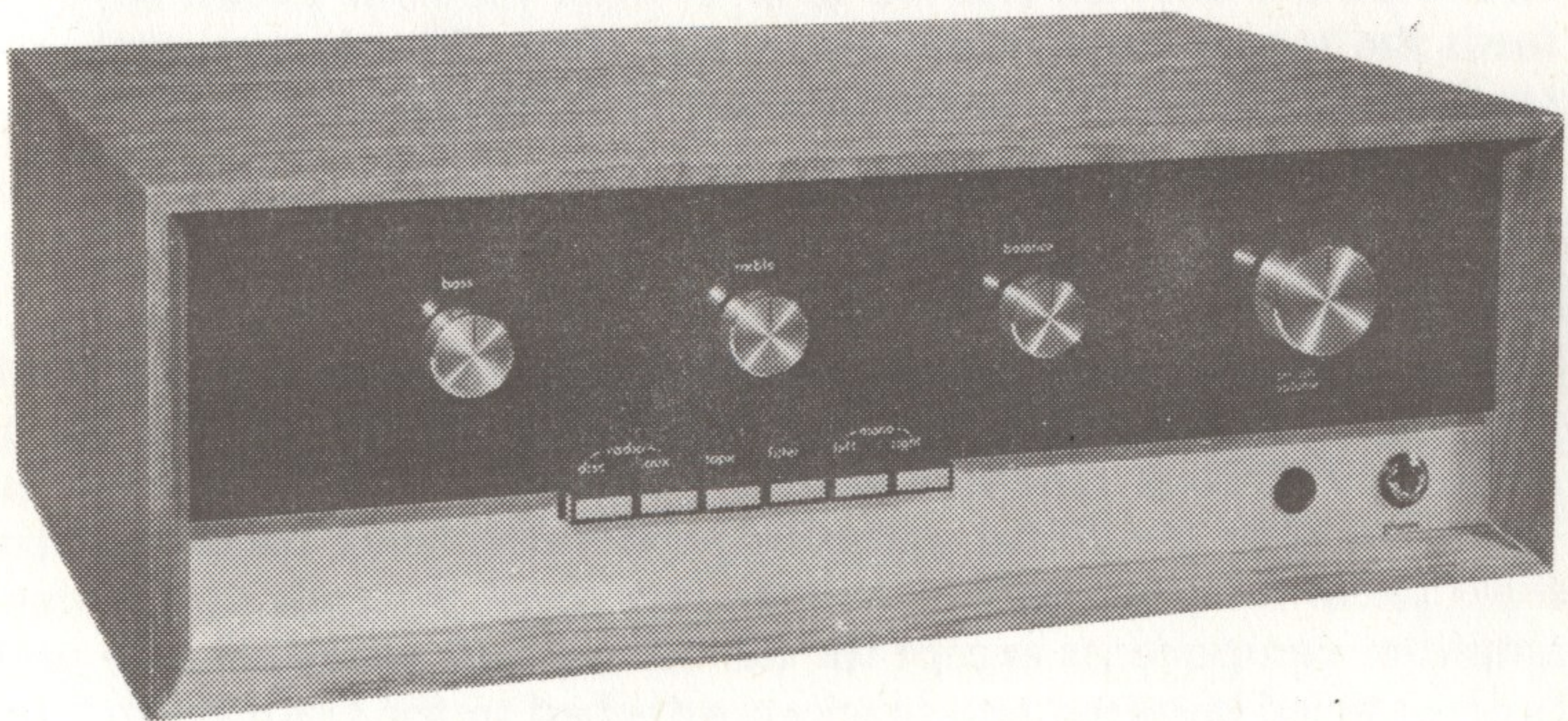
The basic chassis is a U section front panel joined to a U section rear panel with two tray section side members and a lateral U section member also joining the two side members. One side member carries the large mains transformer, the lateral member the power smoothing and loudspeaker coupling capacitors, the front panel the pre amplifier and the rear panel the power amplifier. The pre amplifier components except for the controls are mounted on a printed circuit board carried between two brackets attached to the front panel. The controls are mounted on the front panel. The whole pre amplifier assembly is then made rigid and screened by a cover bent and formed from 22 gauge steel. All other steel parts are formed from 18 or 16 gauge mild steel. The power amplifier circuits are carried on two steel angles spaced from the rear panel on brass spacers and the power transistors are mounted on four massive heatsinks mounted outside the rear panel and machined from a special aluminium extrusion specially produced for J. E. Sugden by Alcan Booth Aluminium. The front panel carries an anodized aluminium fascia panel and the whole construction slides into a sleeve cabinet, having a front rebate, from the rear such that no unsightly gaps appear round the edges of the fascia panel—the edges are hidden by the solid teak front rebated lipping. The top, bottom and sides of the cabinet are formed from warp free chipboard.

FINISH

The cabinet is veneered in an attractive real teak and polished with a melamine varnish. The inside of the cabinet also has a balancing veneer. All internal ferrous metalwork is zinc plated and chromate passivated for maximum corrosion resistance as are all nuts, screws, fastenings, etc. The heatsinks are anodized matt black and the rear panel is trimmed with aluminium plates faced with matt white PVC upon which socket identifying legend, etc. is printed using a scratch resistant vinyl solvent ink. The facia panel is anodized, printed and sealed and the control knobs have spun aluminium cappings.

GENERAL

Dimensions	15.9" x 5.8" x 11.1" 41cms x 15cms x 28cms
Weight	24lbs. 11.3Kgm.
Accessories supplied	4 5 pin DIN plugs. 4 colour coded loudspeaker plugs. 1 Aux. mains outlet plug.
Mains supply required	110 - 120 - 220 - 230 - 240 volts A.C. 50/60Hz set by adjustment at rear.
Mains cable fitted	3 core 3 metres long.



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