M900 MOS-FET PROFESSIONAL POWER AMPLIFIER

YOU CAN DEPEND ON IT.

NO ONE CARES MORE
ABOUT YOUR SOUND THAN

H|H

M900 MOS-FET PO

Virtually flawless performance at less cost per Watt
Features exceptional reliability and outstanding technical specificatio

The new M900 asserts HH's continuing leadership in professional power amplifiers

In 1979 HH pioneered the first MOS-FET professional power amplifiers by introducing the V-Range to the audio industry. Since that time our famous MOS-FET amplifiers have established a tremendous reputation for excellent reliability and superior performance. Many thousands of these fine amplifiers are giving dependable power in a wide range of applications on the road or in permanent commercial and studio installations. Following this tradition, the M900 offers the many benefits of HH MOS-FET amplifier technology but is presented in a 'no-frills' rugged mechnical design of steel and heavy gauge aluminium with the emphasis on function and value for money. The M900 gives high power, high accuracy sound at low cost-per-watt and is designed to be used with mixers, frequency dividing networks and speakers – on the road or in permanent installations.

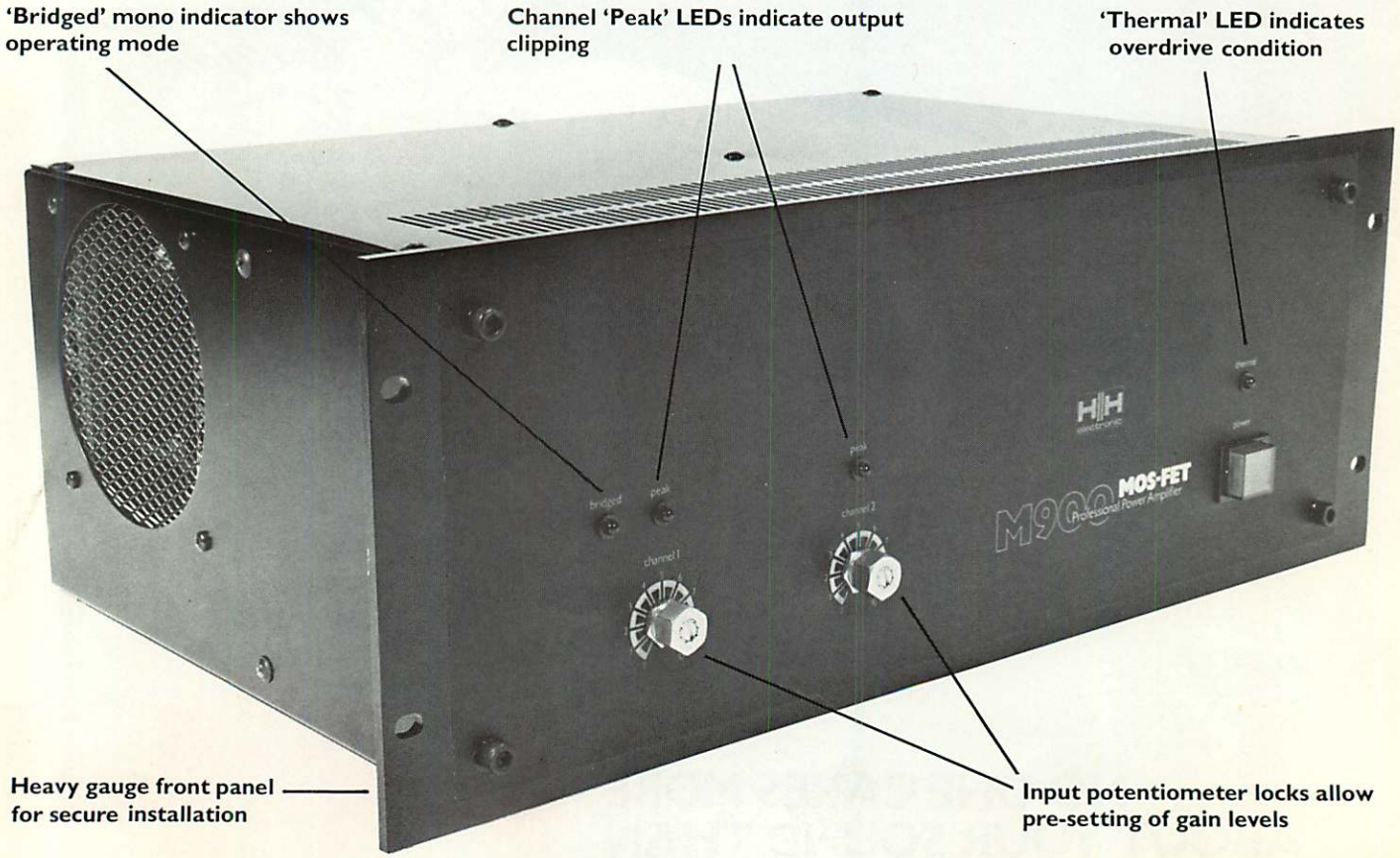
HH MOS-FETs make the grade!
The exciting benefits of HH MOS-FET amplifier technology are clearly demonstrated.

- **Cooler running and superior matching**
As the temperature increases the current through the device tends to decrease so MOS-FETs exhibit a kind of self-compensating thermal control which prevents thermal runaway. This characteristic also helps paralleled output devices to 'current share' the load power automatically without the need for expensive device matching or additional components.

- **Exceptional reliability under tough load conditions**
Unlike bipolar transistors, MOS-FETs do not have a second-breakdown mechanism and are inherently more reliable. This means that expensive and complex protection circuits which can cause spurious sound problems are not required. MOS-FET devices exhibit a wide safe- operating-area which allows them to deliver high power with superior reliability.

- **High accuracy response gives cleaner sound**
MOS-FETs are voltage operated devices with similar characteristics to a pentode valve: this results in simpler circuitry which performs at very low levels of dynamic distortion. Also the M900 MOS-FETs are much faster than bipolar transistors which allows a fast slew rate to be specified and ensures freedom from slew induced distortion. Careful control of the feedback loop around a finely balanced differential pair drive circuit, have yielded an amplifier with particularly low TID and THD figures.

- **Differential circuit design gives stability from the moment of switch-on**
Differential pairs have been used throughout the M900 to form not only the input stage but also the voltage gain stage. This ensures that the distortion characteristics of the input and voltage gain stages are low enough so that the open loop characteristics of the M900 are determined by the output stage. The improved frequency and phase linearity of the differential pair ensure the M900 meets the Nyquist stability criterion. From the moment you turn on, the M900 will give stable predictable power into tough load conditions.



Functional front panel layout for straightforward operation

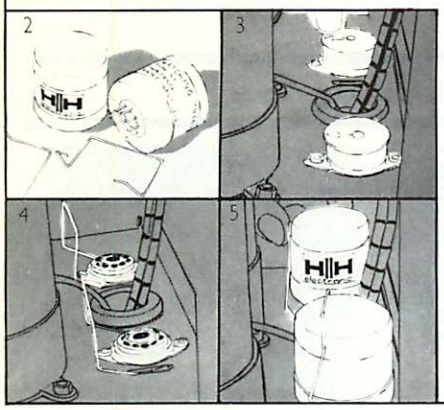
WER AMPLIFIER

ns 400 + 400 Watts

Optional input transformer installation gives balanced line operation with effective hum and noise rejection

The M900 is equipped with two pre-wired sockets to accommodate optional input transformers. Normally jumper plugs are fitted to the sockets. Installation of the input transformers is as follows –

1. DISCONNECT THE AMPLIFIER FROM THE MAINS SUPPLY.
2. Remove the amplifier top cover.
3. Remove the jumper plugs.
4. Fit the input transformers to the sockets.
5. Fix the retaining clips.
6. Replace the top cover.



Output connector
Pin 1 – ground
Pin 2 – signal
Pin 3 – no connection

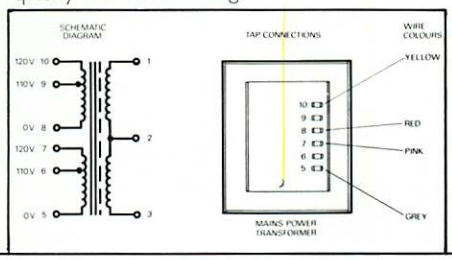
XLR-3-32

Input connector
Pin 1 – ground
Pin 2 – phase
Pin 3 – non-phase

XLR-3-31

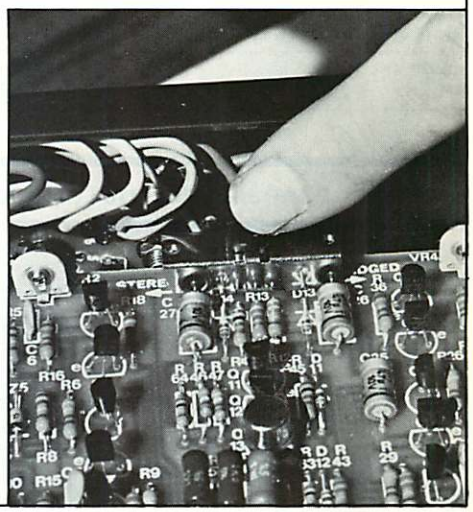
Mains power transformer connections for various line voltages

DISCONNECT THE AMPLIFIER FROM THE MAINS SUPPLY. Normally the M900 is supplied pre-wired for 240/120 Volt a.c. operation as indicated on the Voltage Selector. Adjustment to 220/110 Volt operation is achieved by adjusting the taps on the mains transformer as shown below. The push-on tags allow this to be done quickly without soldering.



Bridged Mono/Stereo switch gets the correct power into your loads

The switch is located on the driver circuit card. To access this, remove the bottom cover. In Mono mode, connect the load across the 'hot' pins 2 of the output XLRs: ensure load is earth free. In stereo mode, separate loads must be connected on each output XLR. Do not connect the two outputs in parallel. Output connections should be made with minimum wire size 30 x 0.2mm gauge.



Rugged steel casing built to withstand arduous conditions of use

Schematic diagram shows functional arrangement for users convenience

Mains power connector, Fuse, and Voltage Selector comply with international supply requirements

XLR-3-32 Professional output connectors

XLR-3-31 Professional input connectors

Large quiet-running fan keeps system cool even under heavy load

Rear panel features give convenient and secure connections

M900 — Technical Specifications

Parameter	M900
Power output at clipping	400 Watts RMS into 4 Ohms 1kHz, both channels driven. 260 Watts RMS into 8 Ohms 520 Watts RMS into 2.5 Ohms
Balanced line output	80 Volt balanced line (bridged mono)
Rated power output per channel	250 Watts RMS into 8 Ohms at <0.03% THD 20Hz to 20kHz both channels driven. 390 Watts RMS into 4 Ohms 1kHz at <0.02% THD both channels driven.
Frequency response	+0, −1.0dB 10Hz to 50kHz.
Intermodulation distortion	Less than 0.03% using frequencies of 50Hz and 7kHz in 4:1 ratio at 400 Watts per channel into 4 Ohms.
Input sensitivity	0.775V for full output into 4 Ohms, attenuator set maximum
Input impedance	15k Ohms unbalanced, optional 600 Ohms or 10k matching transformers
Damping factor (8 Ohms)	Greater than 300 at 100Hz
Hum and noise	Greater than −100dB ref full output, 20Hz to 20kHz

Rise time	3μs or less (10%−90%) of 1V, 1kHz output
Slew rate	45V/μs
Power requirements	240V, 220V, 120V, 110V, 50/60Hz AC only
Input connectors	1 off XLR 3-31 per channel.
Output connectors	2 off XLR 3-32 per channel.
Bridged mono output	800 Watts RMS into 8 Ohms at less than 0.02% THD at 1kHz
Indicators	One 'Peak' indicating LED per channel. 'Thermal' shutdown indicator. Red LED 'bridged' indicator.
Protection	Short circuit, open circuit, and mismatch proof
Load protection	Protection relay energised by presence of a DC fault condition at the amplifier output.
Dimensions width height depth	483mm/19.0" 178mm/7.0" 300mm/11 7/8"
Weight	21.9kg/47.3lb
Cooling	Thermostatically controlled fan.

Searching measurement techniques reveal the excellence of the M900 performance

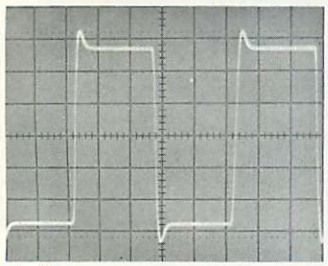


Fig 1
10 kHz load 8 ohms + 1uF

Reactive load impulse response. Note single overshoot, well damped, no ringing.

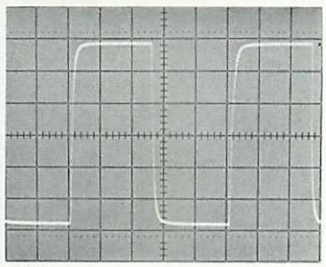


Fig 2
10 kHz into 8 ohms

10 kHz square wave response. Note Fast rise time, clean response.

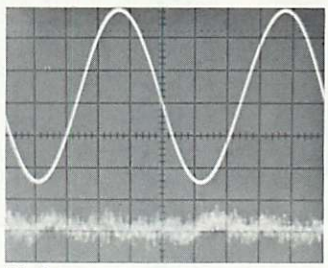


Fig 3
1 kHz into 8 ohms

Scope gain x 2000. Note Distortion components lost in noise. Harmonic distortion less than 0.005%.

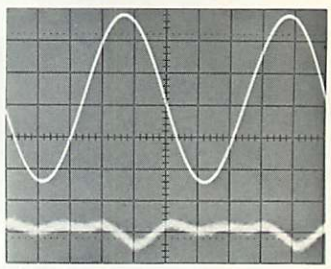


Fig 4
10 kHz into 8 ohms

Scope gain x 1000. Note complete absence of crossover distortion. Harmonic distortion less than 0.01%.

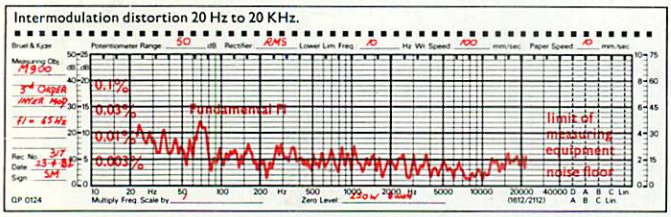


Fig 5

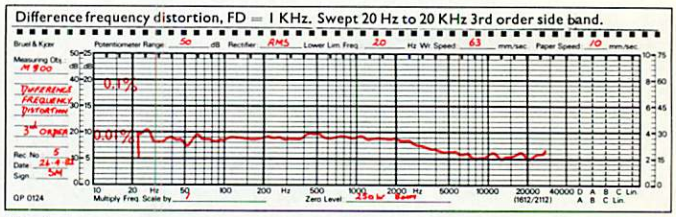


Fig 6

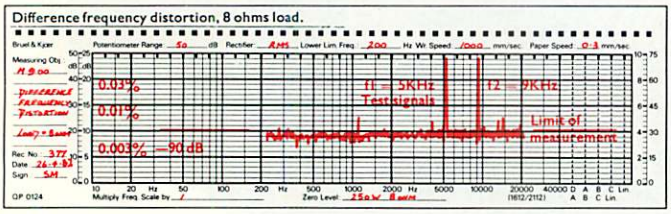


Fig 7

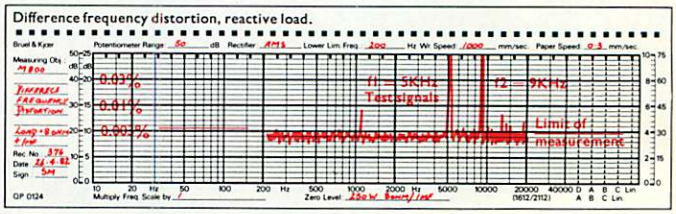


Fig 8

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